

Access DB# 188728

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Lee, R. A. Examiner #: 78600 Date: MAY 04, 2006  
Art Unit: 1713 Phone Number: 2-1104 Serial Number: 10/536,858  
Mail Box and Bldg/Room Location: RM 10A24 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

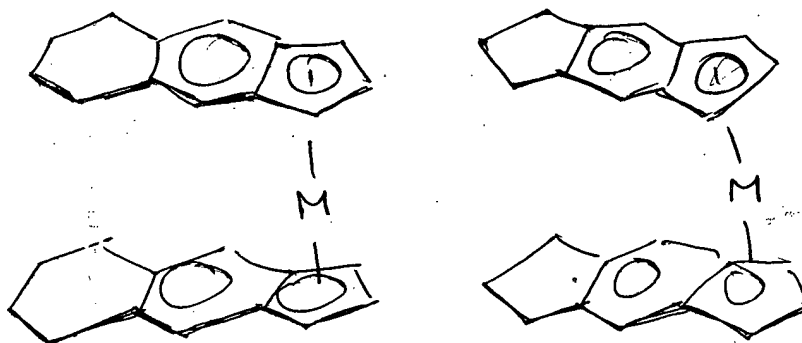
Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Process for preparing 1-butene polymers SCIENTIFIC REFERENCE BR  
Inventors (please provide full names): RESCONI, Luigi Sci & Tech Inf. Ctr.  
INSURGA, Antonio E MAY 4 REC'D

Earliest Priority Filing Date: 04/12/2002 Pat. & T.M. Office

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search for compounds containing the minimum structure shown below (does not have to be bridged)



## STAFF USE ONLY

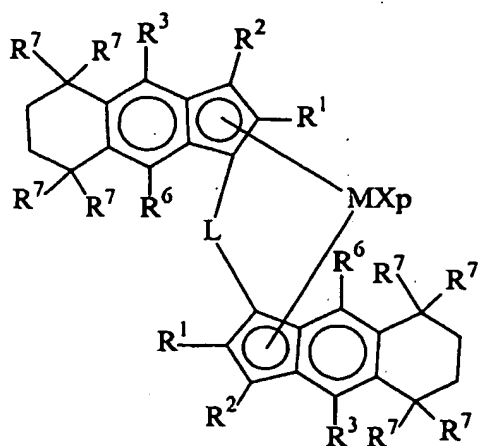
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Searcher Prep & Review Time: \_\_\_\_\_  
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Online Time: \_\_\_\_\_

## Type of Search

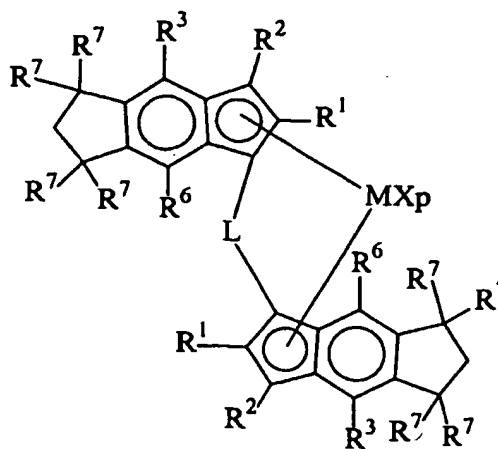
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AA Sequence (#) \_\_\_\_\_  
Structure (#) \_\_\_\_\_  
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Litigation \_\_\_\_\_  
Fulltext \_\_\_\_\_  
Patent Family \_\_\_\_\_  
Other \_\_\_\_\_

## Vendors and cost where applicable

STN \_\_\_\_\_  
Dialog \_\_\_\_\_  
Questel/Orbit \_\_\_\_\_  
Dr. Link \_\_\_\_\_  
Lexis/Nexis \_\_\_\_\_  
Sequence Systems \_\_\_\_\_  
WWW/Internet \_\_\_\_\_  
Other (specify) \_\_\_\_\_



(IIa)

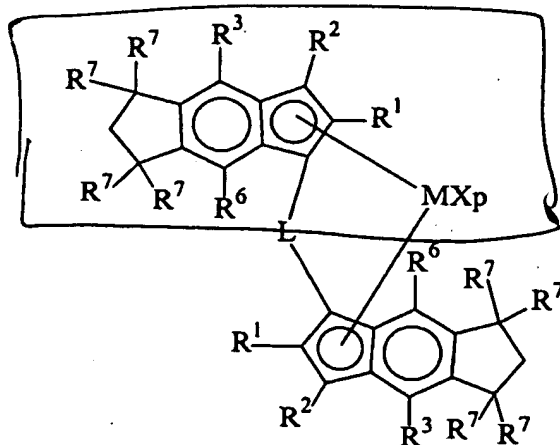


(IIb)

wherein:

M, X, p, L, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>6</sup> and R<sup>7</sup> have the same meaning as in claim 1.

6. The process according to anyone of claims 1 to 5 wherein 1-butene is homopolymerized.
7. A metallocene compound of formula (IIb):



(IIb)

wherein M, p, L, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>6</sup>, R<sup>7</sup> and X have the same meaning as in claim 1.

8. A ligand of formula (V) or its corresponding double bond isomer:

=> file reg

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PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 2006 American Chemical Society (ACS)

=> d his

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L1 262 S RESCONI ?/AU  
L2 1 S INGURGIO ?/AU  
L3 1 S L1 AND L2  
SEL L3 1 RN

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L4 34 S E1-E34

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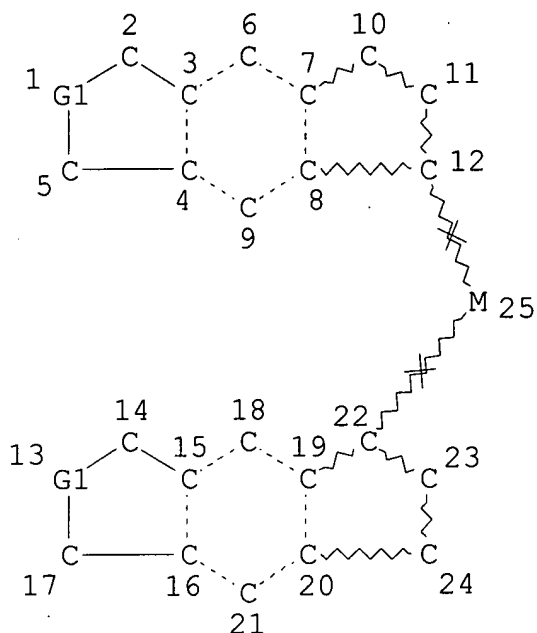
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FILE 'ZCAPLUS' ENTERED AT 09:32:04 ON 12 MAY 2006  
L9 8 S L7

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=> d l7 que stat

L5 STR



REP G1=(1-2) C  
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 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 25

STEREO ATTRIBUTES: NONE  
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44 ANSWERS

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 COPYRIGHT (C) 2006 AMERICAN CHEMICAL SOCIETY (ACS)

=> d 19 1-8 ibib abs hitstr hitrn

L9 ANSWER 1 OF 8 ZCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2006:103448 ZCAPLUS  
DOCUMENT NUMBER: 144:171492  
TITLE: Polymer production at supercritical conditions  
using metallocene catalysts  
INVENTOR(S): Brant, Patrick; Rix, Francis C.; Kiss, Gabor;  
Reynolds, Robert  
PATENT ASSIGNEE(S): USA  
SOURCE: U.S. Pat. Appl. Publ., 58 pp., Cont.-in-part of  
U.S. Ser. No. 667,585.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 4  
PATENT INFORMATION:

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US 2006025545	A1	20060202	US 2005-177004	200507 08
US 2004122191	A1	20040624	US 2003-667586	200309 22
US 2004127654	A1	20040701	US 2003-667585	200309 22
PRIORITY APPLN. INFO.:			US 2002-412541P	P 200209 20
			US 2002-431077P	P 200212 05
			US 2003-667585	A2 200309 22
			US 2003-667586	A2 200309 22
			US 2004-586465P	P 200407 08

AB The invention relates to a process to polymerize olefins comprising contacting, in a polymn. system, olefins having three or more carbon atoms with a catalyst compd., activator, optionally comonomer, and optionally diluent or solvent, at a temp. above the cloud point temp. of the polymn. system and a pressure no lower than 10 MPa below the cloud point pressure of the polymn. system, where the polymn. system comprises any comonomer present, any diluent or solvent present, the polymer product, where the olefins having three or more carbon atoms are present at 40 wt. % or more, wherein the catalyst is a metallocene of 2 indene derivs. and Zr, Hf, or Ti, is bridged by a hydrocarbon chain optionally contg. B, Al, N, P, Si, or Ge atoms on the cyclopentadienyl ring next to the benzene ring, and has, attached to the metal, 2 groups that may be linked but not form a butadiene group when the metal is Zr.

IT **872883-97-1 872883-98-2 872884-00-9**

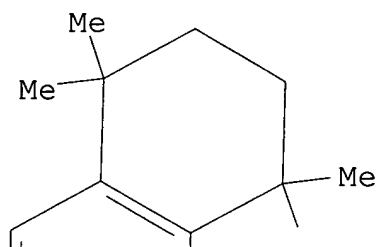
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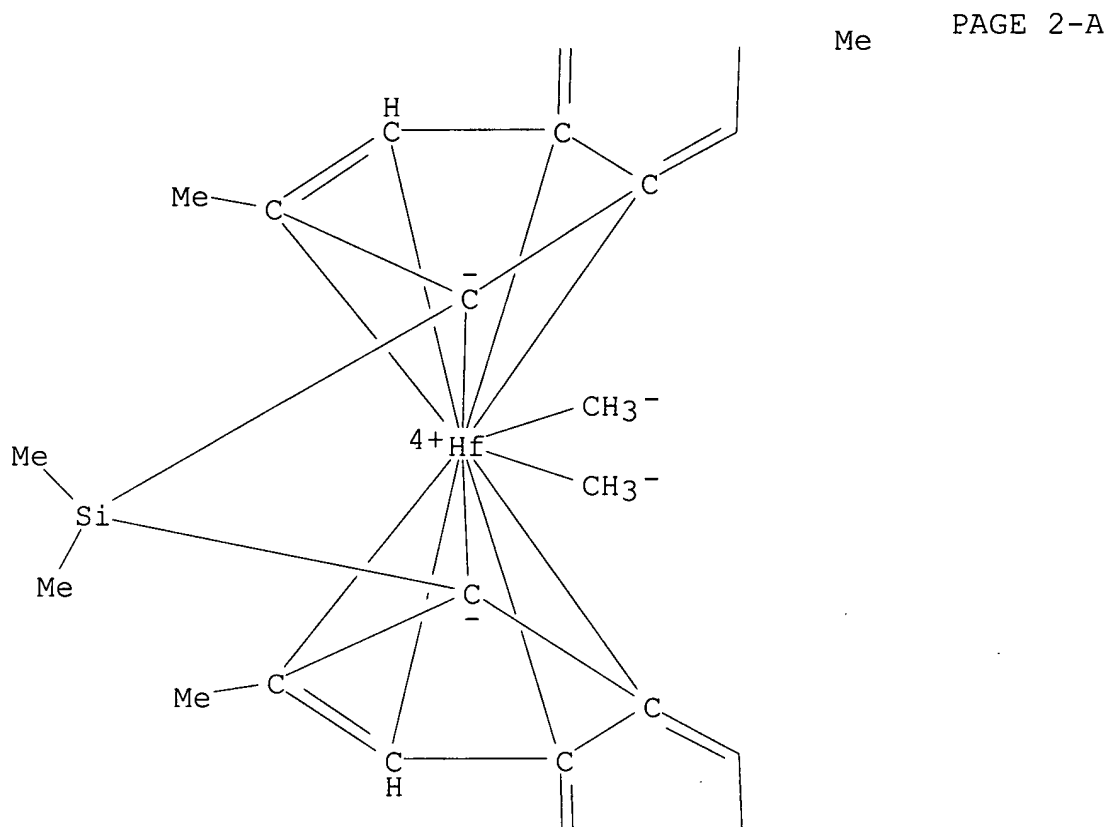
(polymer prodn. at supercrit. conditions using metallocene catalysts)

RN 872883-97-1 ZCAPLUS

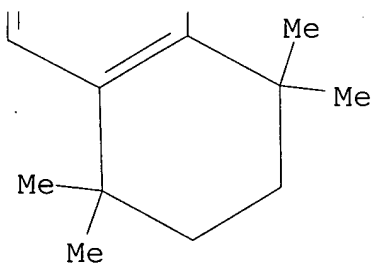
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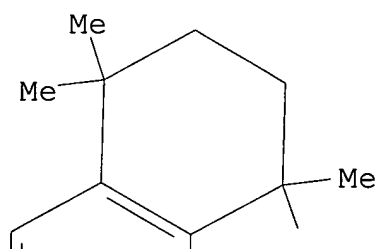


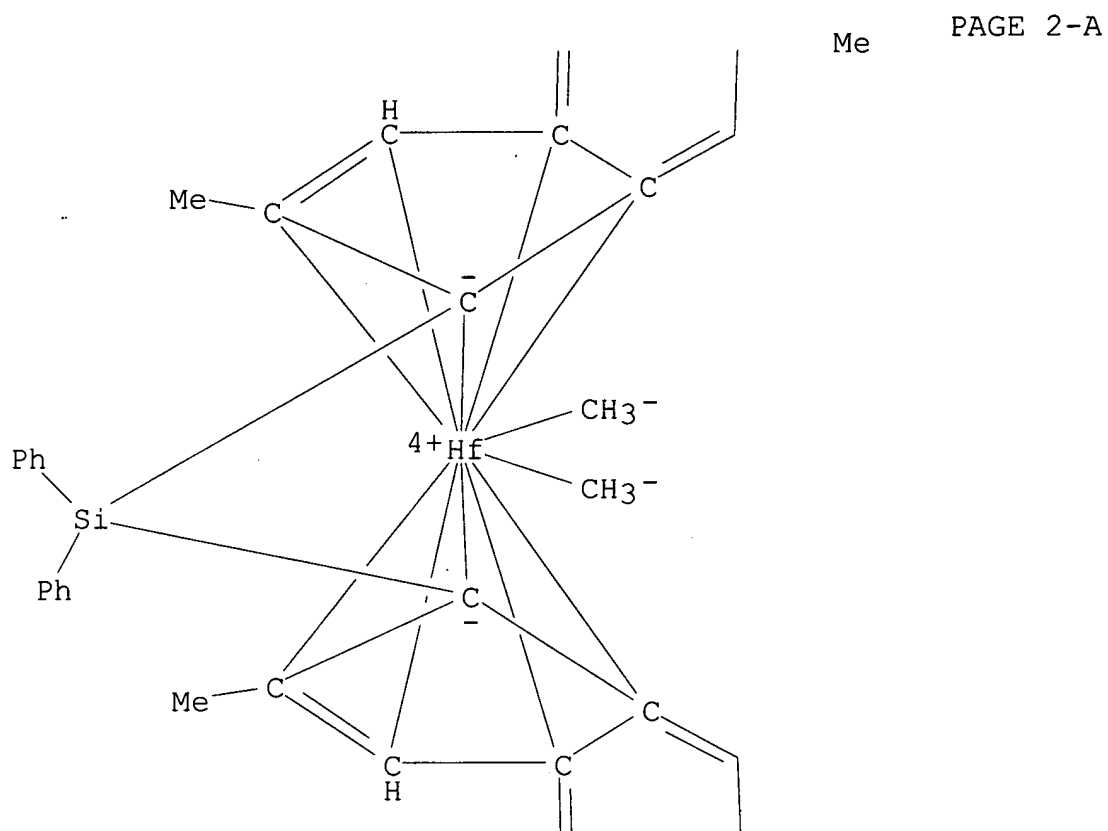
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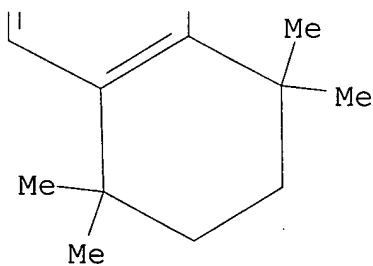
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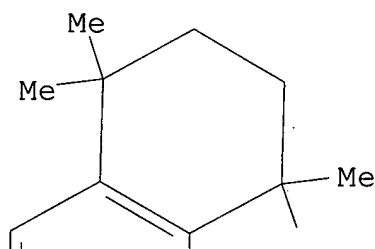


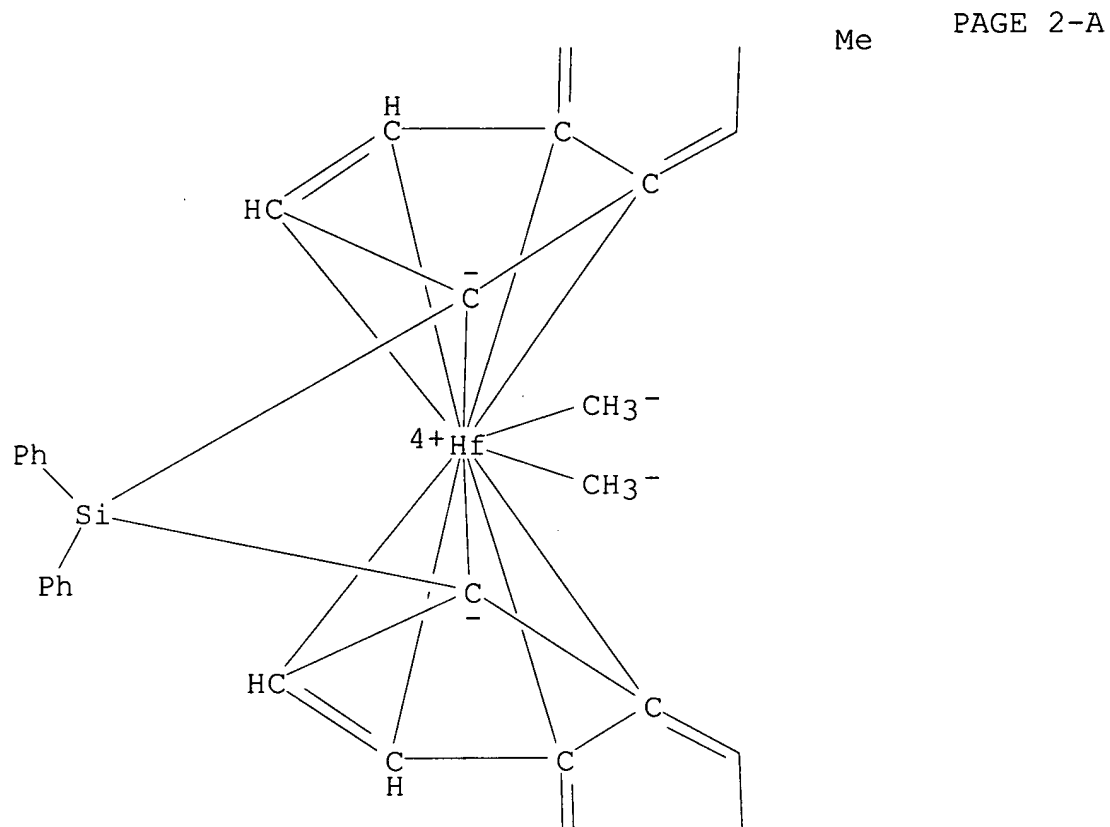
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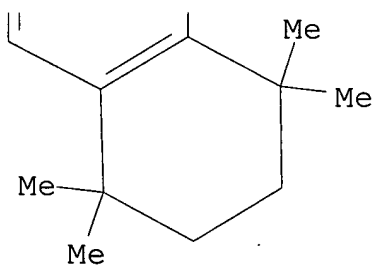
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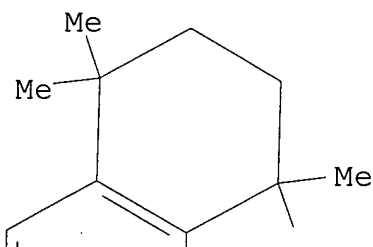


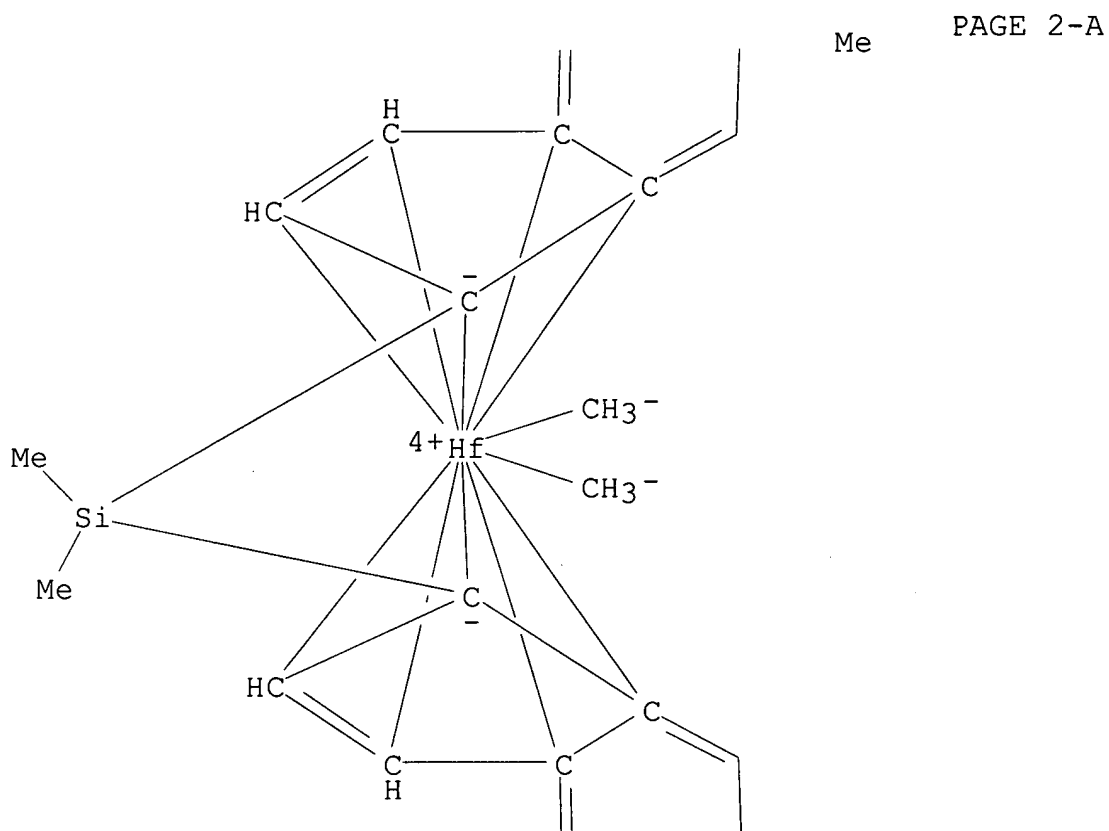
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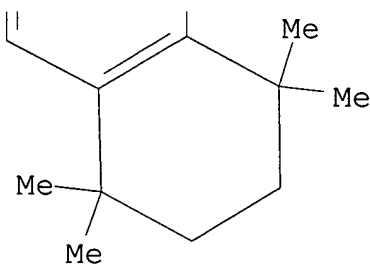
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CN INDEX NAME NOT YET ASSIGNED

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IT 872883-97-1 872883-98-2 872884-00-9  
874485-52-6

(polymer prodn. at supercrit. conditions using metallocene catalysts)

L9 ANSWER 2 OF 8 ZCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2006:36983 ZCAPLUS

DOCUMENT NUMBER: 144:129401  
 TITLE: Olefin polymerization catalyst system and process for use thereof  
 INVENTOR(S): Rix, Francis C.; Kacker, Smita; Datta, Sudhin; Zhao, Rul; Eswaran, Vetkav R.  
 PATENT ASSIGNEE(S): USA  
 SOURCE: U.S. Pat. Appl. Publ., 43 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 4  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2006009595	A1	20060112	US 2005-178147	20050708
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PRIORITY APPLN. INFO.:

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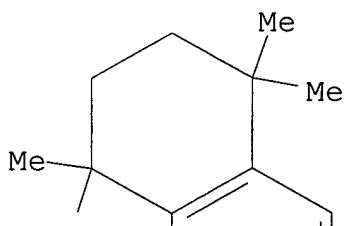
AB The invention relates to novel transition metal compds. with a bridged bidentate ligand contg. tetrahydrobenz[f]indenyl derivs. and to processes to polymerize or oligomerize unsatd. monomers using these transition metal compds. and polymers or oligomers produced therefrom. Thus, rac-dimethylsilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium di-Me was prepd., mixed with N,N-dimethylanilinium tetrakis(pentafluorophenyl)borate (activator) and used as a catalyst for polymg. propylene.

IT **872884-06-5P**, Rac-cyclotrimethylenesilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dichloride (intermediate; prepn. of olefin metallocene polymn. catalyst contg. bridged bidentate ligand of tetrahydrobenz[f]indenyl derivs.)

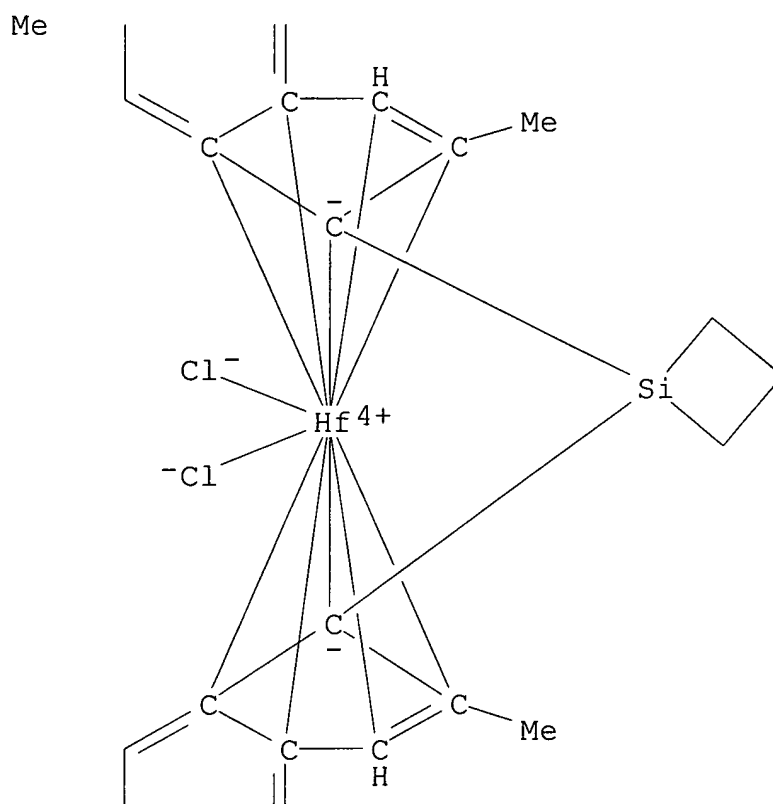
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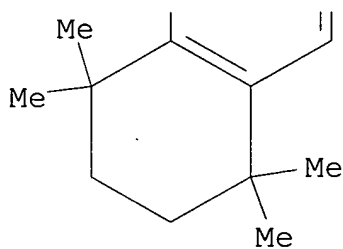
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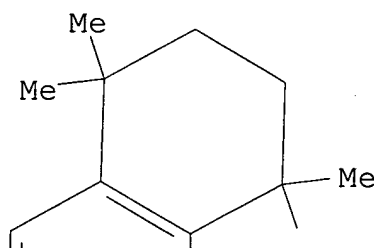
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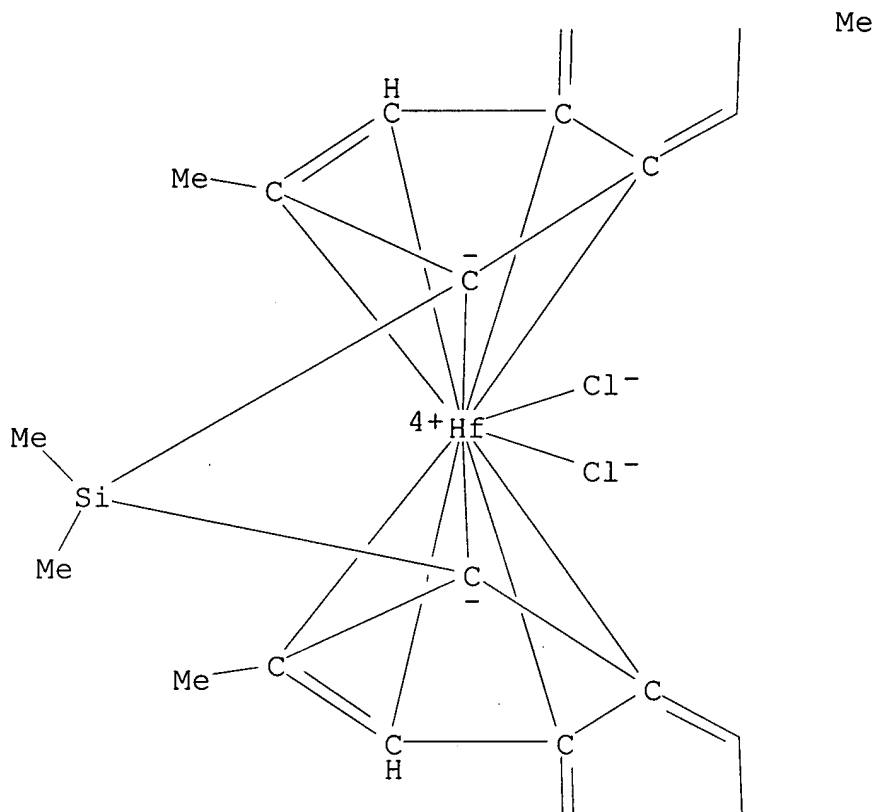
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- RN 872884-02-1 ZCAPLUS
- CN Hafnium, dichloro[rel-(1R,1'R)-(dimethylsilylene)bis[(1,2,3,3a,9a-eta.)-5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-1H-benz[f]inden-1-

ylidene]]- (9CI) (CA INDEX NAME)

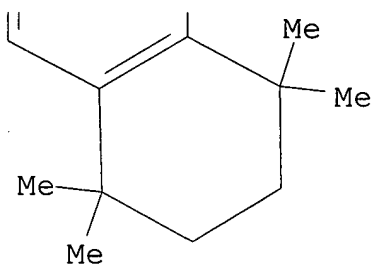
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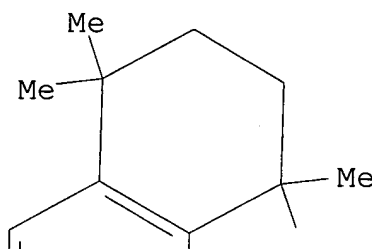


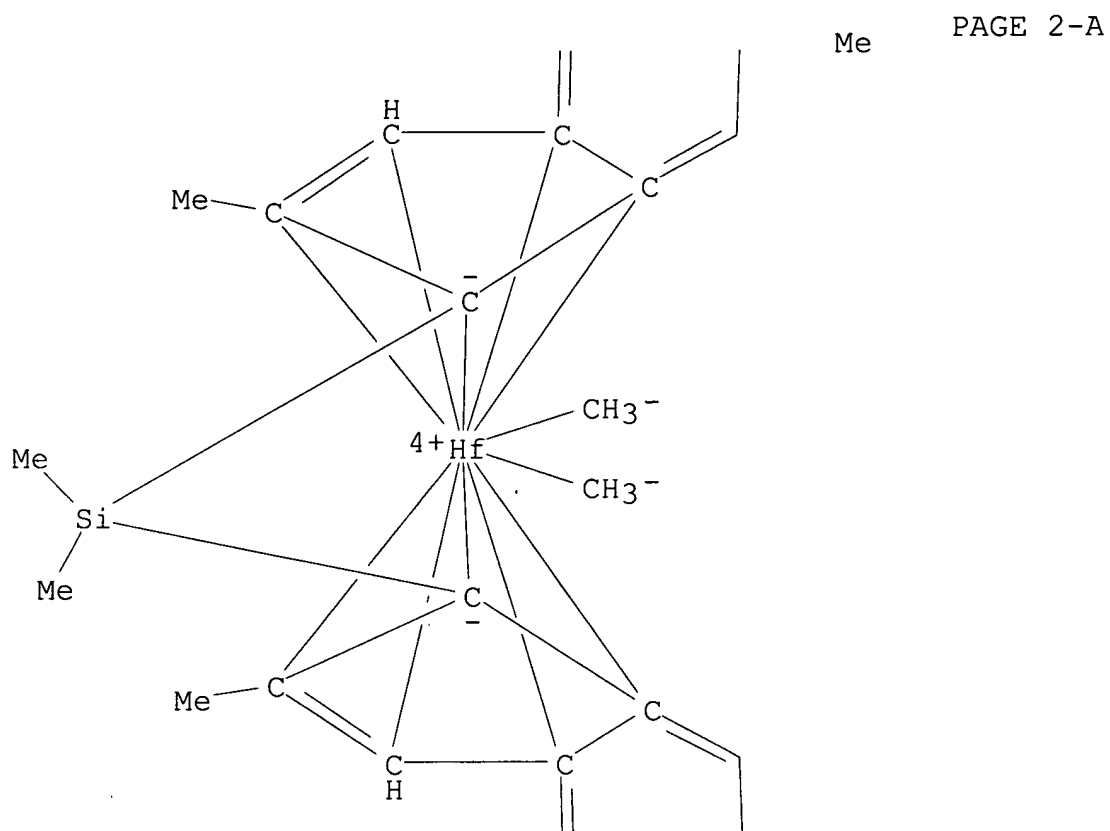
- IT **872883-97-1P**, Rac-Dimethylsilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dimethyl  
**872883-98-2P**, Rac-Diphenylsilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dimethyl  
**872883-99-3P**, Rac-cyclotrimethylenesilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dimethyl  
**872884-00-9P**, Rac-Diphenylsilylenebis(5,6,7,8-tetrahydro-

5,5,8,8-tetramethyl-benz[f]indenyl)hafnium dimethyl  
**872884-01-0P**, Rac-Diphenylsilylenebis(5,6,7,8-tetrahydro-  
2,5,5,8,8-pentamethyl-benz[f]indenyl)zirconium dimethyl  
**872884-04-3P**, Rac-Diphenylsilylenebis(5,6,7,8-tetrahydro-  
2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dichloride  
**872884-07-6P**, Rac-Diphenylsilylenebis(5,6,7,8-tetrahydro-  
5,5,8,8-tetramethyl-benz[f]indenyl)hafnium dichloride  
(prepn. of olefin metallocene polymn. catalyst contg. bridged  
bidentate ligand of tetrahydrobenz[f]indenyl derivs.)

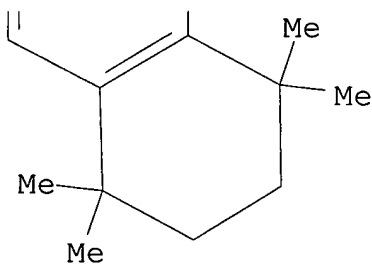
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PAGE 1-A



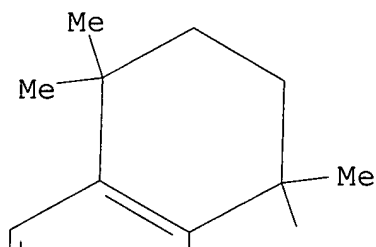


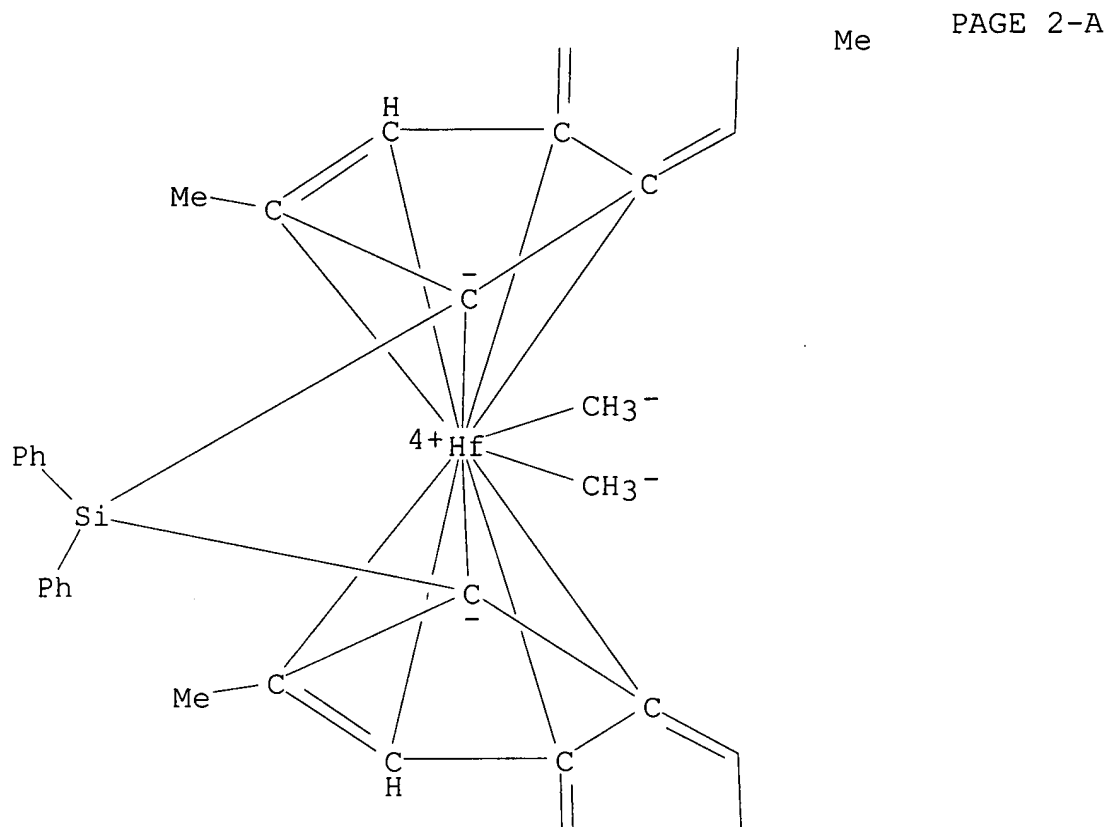
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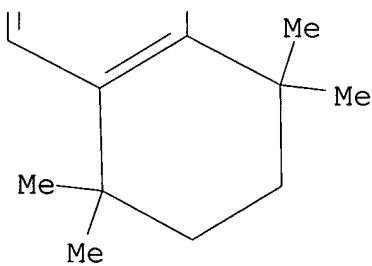
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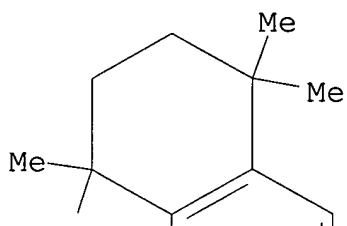


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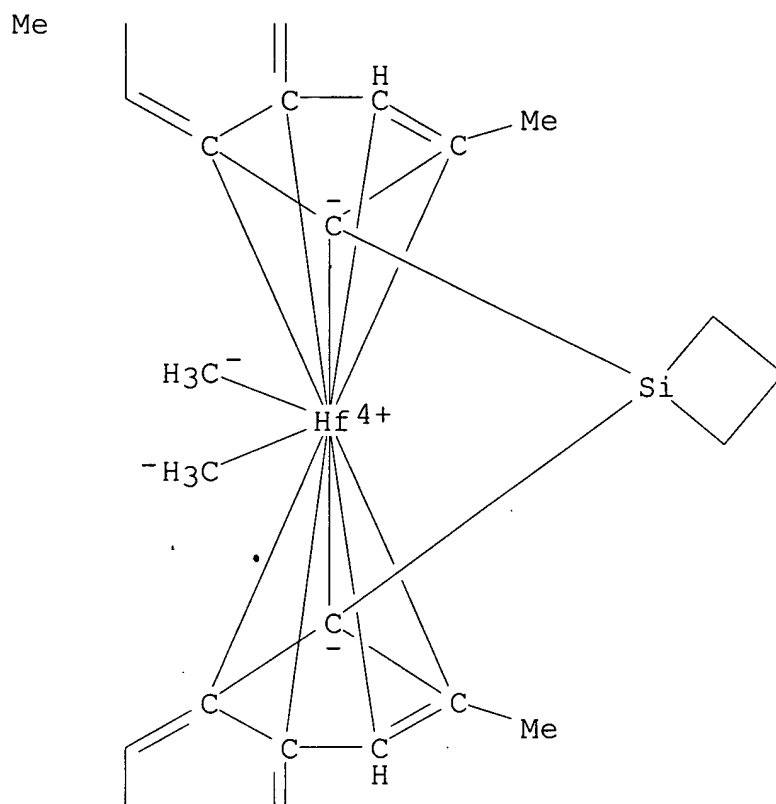


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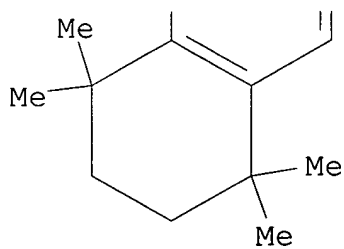
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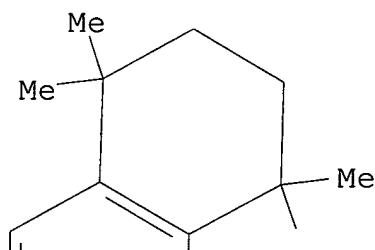


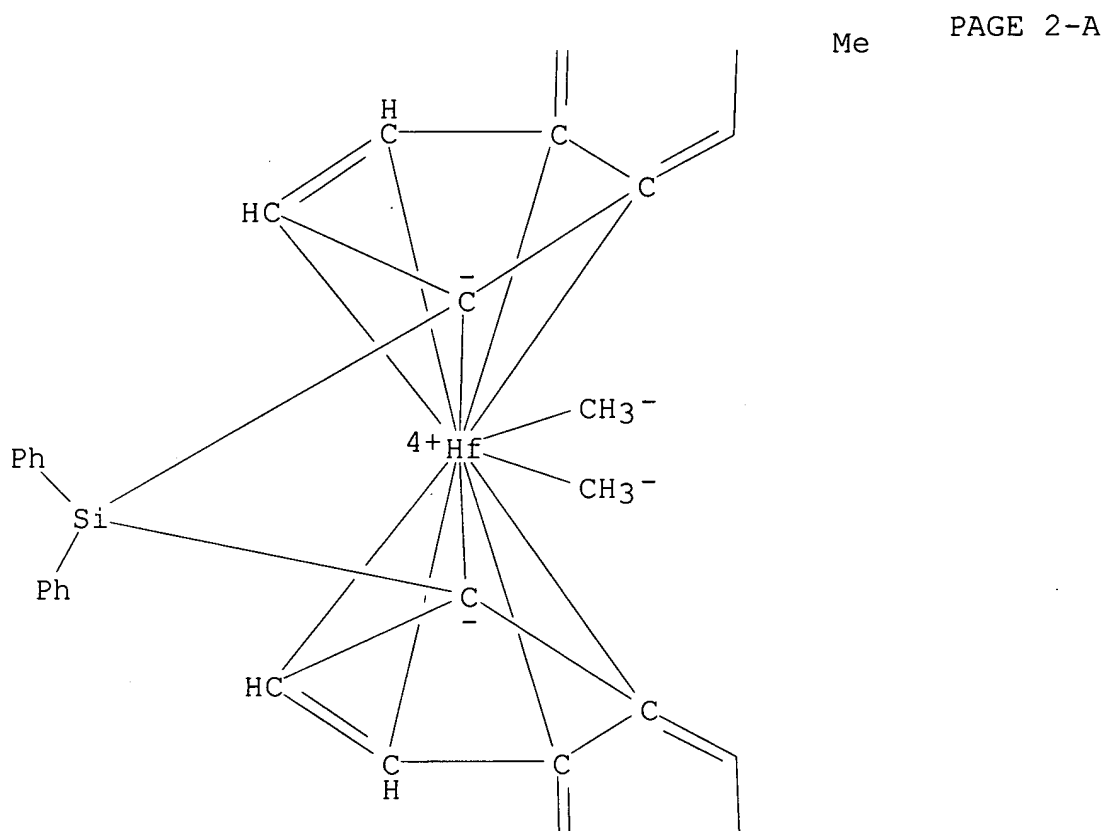
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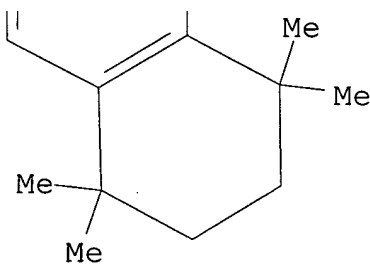
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 CN Hafnium, [rel-(1R,1'R)-(diphenylsilylene)bis[(1,2,3,3a,9a-.eta.)-5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-1H-benz[f]inden-1-ylidene]]dimethyl- (9CI) (CA INDEX NAME)

PAGE 1-A



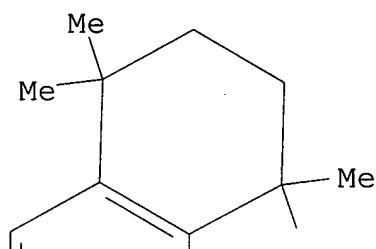


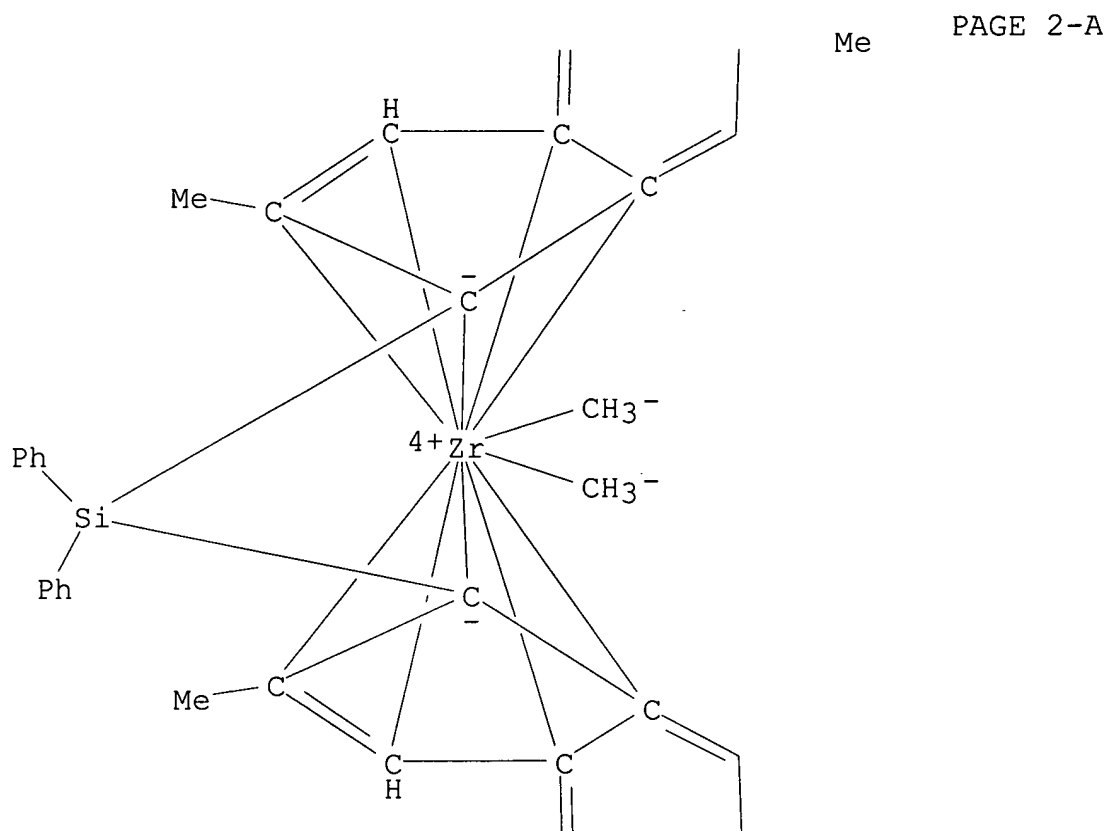
PAGE 3-A



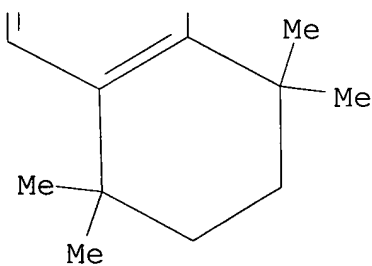
RN 872884-01-0 ZCAPLUS  
 CN Zirconium, [rel-(1R,1'R)-(diphenylsilylene)bis[(1,2,3,3a,9a-.eta.)-5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-1H-benz[f]inden-1-ylidene]]dimethyl- (9CI) (CA INDEX NAME)

PAGE 1-A





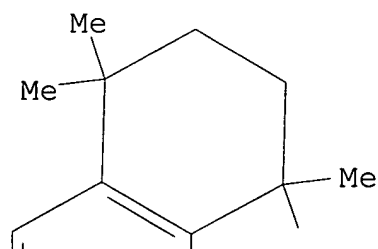
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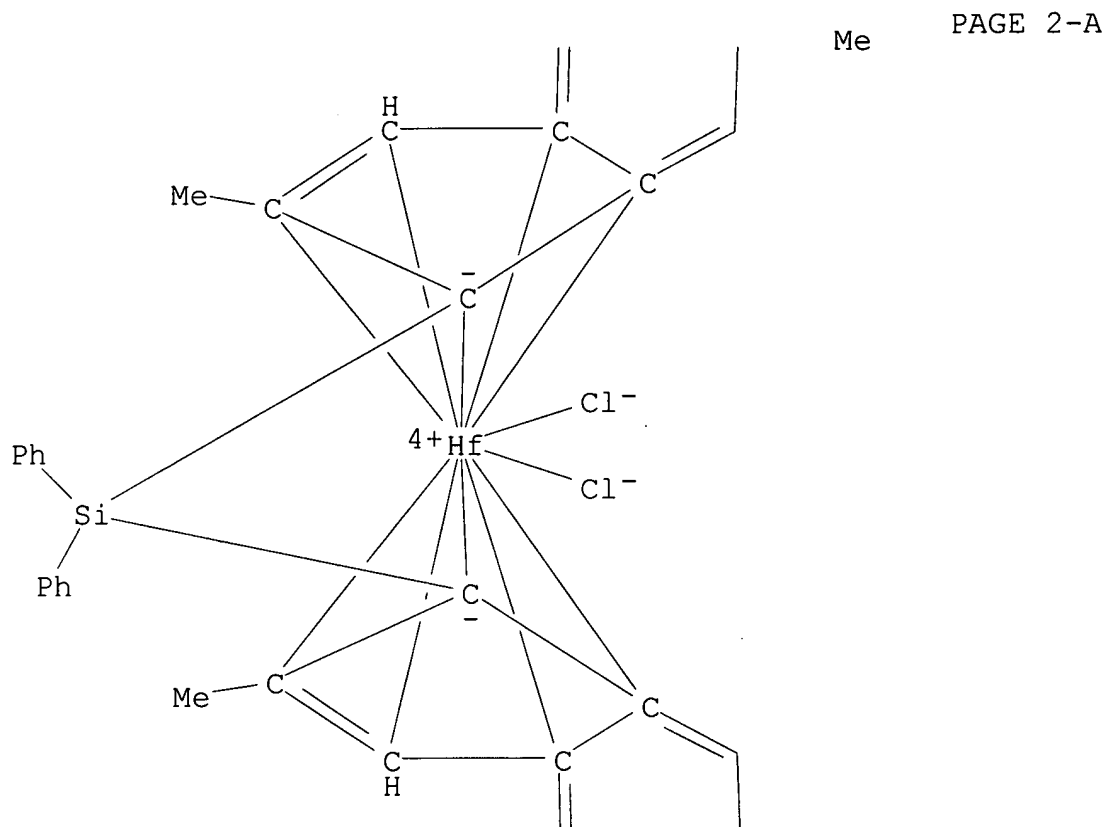


RN 872884-04-3 ZCAPLUS

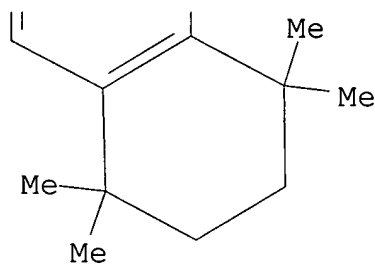
CN Hafnium, dichloro[rel-(1R,1'R)-(diphenylsilylene)bis[(1,2,3,3a,9a-  
 .eta.)-5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-1H-benz[f]inden-1-  
 ylidene]]- (9CI) (CA INDEX NAME)

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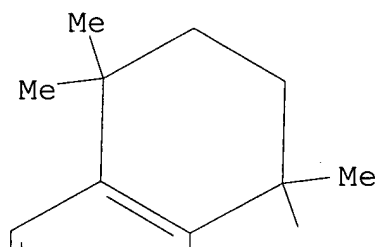


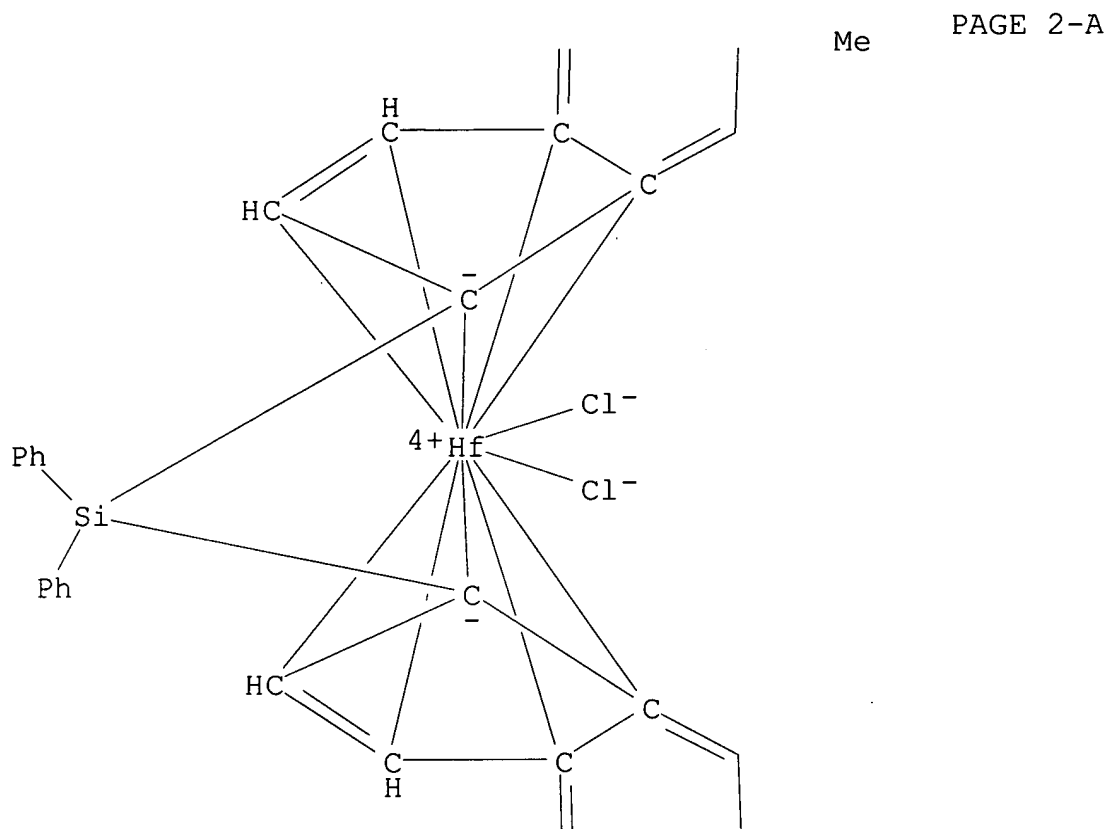
PAGE 3-A



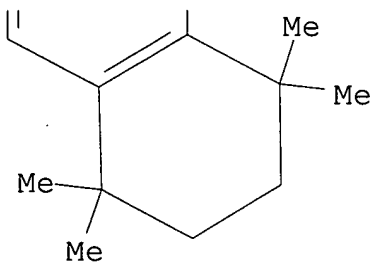
RN 872884-07-6 ZCAPLUS  
 CN Hafnium, dichloro[rel-(1R,1'R)-(diphenylsilylene)bis[(1,2,3,3a,9a-  
 .eta.)-5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-1H-benz[f]inden-1-  
 ylidene]]- (9CI) (CA INDEX NAME)

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- IT **872884-06-5P**, Rac-cyclotrimethylenesilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dichloride (intermediate; prepn. of olefin metallocene polymn. catalyst contg. bridged bidentate ligand of tetrahydrobenz[f]indenyl derivs.)
- IT **872884-02-1P**, Rac-Dimethylsilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dichloride

(intermediate; prepn. of olefin metallocene polymn. catalyst contg. bridged bidentate ligand of tetrahydrobenz[f]indenyl derivs.)

IT **872883-97-1P**, Rac-Dimethylsilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dimethyl  
**872883-98-2P**, Rac-Diphenylsilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dimethyl  
**872883-99-3P**, Rac-cyclotrimethylenesilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dimethyl  
**872884-00-9P**, Rac-Diphenylsilylenebis(5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-benz[f]indenyl)hafnium dimethyl  
**872884-01-0P**, Rac-Diphenylsilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)zirconium dimethyl  
**872884-04-3P**, Rac-Diphenylsilylenebis(5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-benz[f]indenyl)hafnium dichloride  
**872884-07-6P**, Rac-Diphenylsilylenebis(5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-benz[f]indenyl)hafnium dichloride  
(prepn. of olefin metallocene polymn. catalyst contg. bridged bidentate ligand of tetrahydrobenz[f]indenyl derivs.)

L9 ANSWER 3 OF 8 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:493760 ZCAPLUS

DOCUMENT NUMBER: 141:38989

TITLE: Preparation of Indenyl-containing metallocene catalyst and its application for 1-butene polymerization

INVENTOR(S): Resconi, Luigi; Cascio Ingurgio, Antonio

PATENT ASSIGNEE(S): Basell Polyolefine G.m.b.H., Germany

SOURCE: PCT Int. Appl., 35 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2004050724	A1	20040617	WO 2003-EP12236	

200311  
03

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW  
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM,

AU 2003276242                  A1        20040623        AU 2003-276242

EP 1567565                  A1                  20050831                  EP 2003-812143

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,  
SK

JP 2006509059                  T2                  20060316                  JP 2004-556103

US 2006052553            A1        20060309            US 2005-536858

PRIORITY APPLN. INFO.:

EP 2002-80120 A

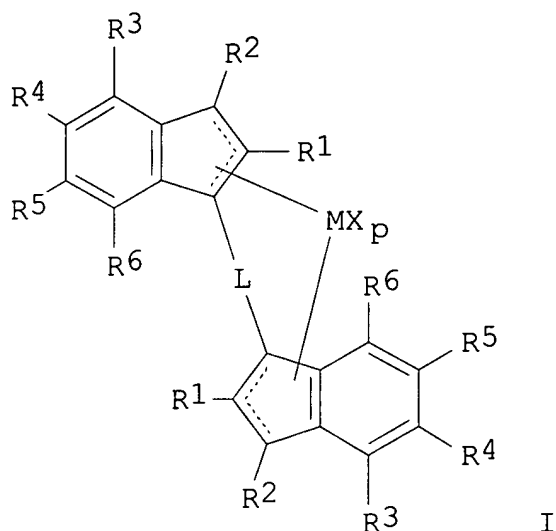
US 2002-431803P P

200212  
09

WO 2003-EP12236 W

200311  
03

OTHER SOURCE(S): MARPAT 141:38989  
GI



AB 1-Butene polymers contg. .1toeq.3 mol.% ethylene, propylene, or an .alpha.-olefin,  $\text{CH}_2 = \text{CHZ}$  ( $\text{Z} = \text{C}_3\text{-C}_{10}$  alkyl), is prep'd. using a catalyst system contg. (a) metallocene comp'd. (I), in which  $\text{M}$  = transition metal belonging to group 3-6, lanthanide group, or actinide groups,  $p = 0\text{-}3$  integer,  $\text{X} = \text{H}$ , halogen,  $\text{R}$ ,  $\text{OR}$ ,  $\text{OSO}_2\text{CF}_3$ ,  $\text{SR}$ ,  $\text{NR}_2$ ,  $\text{PR}_2$  ( $\text{R} = \text{C}_1\text{-}20$  alkyl,  $\text{C}_3\text{-}20$  cycloalkyl,  $\text{C}_6\text{-}20$  aryl,  $\text{C}_7\text{-}20$  alkylaryl),  $\text{R}_1 = \text{C}_3\text{-}20$  cycloalkyl,  $\text{C}_6\text{-}20$  aryl,  $\text{C}_7\text{-}20$  alkylaryl,  $\text{R}_2$ ,  $\text{R}_3$ ,  $\text{R}_6 = \text{C}_1\text{-}20$  alkyl,  $\text{C}_3\text{-}20$  cycloalkyl,  $\text{C}_6\text{-}20$  aryl,  $\text{C}_7\text{-}20$  alkylaryl,  $\text{R}_4$  and  $\text{R}_5$  join to form a condensed sat'd. or unsat'd. 4-7 membered ring, and  $\text{L} =$  divalent bridging group selected from  $\text{C}_1\text{-}20$  alkylidene,  $\text{C}_3\text{-}20$  cycloalkylidene,  $\text{C}_6\text{-}20$  arylidene,  $\text{C}_7\text{-}20$  alkylarylidene, or  $\text{C}_7\text{-}20$  arylalkylidene, (b) an alumoxane or a comp'd. able to form an alkylmetallocene cation, and, optionally, an org. aluminum comp'd. The synthesis of catalyst (a) is also provided. Thus, 1-butene was polymd. using a catalyst system contg.  $\text{rac-Me}_2\text{Si}[2\text{-Me-}5,6\text{-(tetramethylcyclotrimethylen)indenyl}]_2\text{ZrCl}_2$ , MAO, and  $\text{Al}(\text{i-But})_3$ .

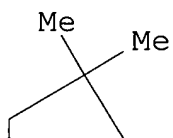
IT **704892-49-9P 704892-50-2P**

(prepn. of indenyl-contg. metallocene catalyst for 1-butene polymn.)

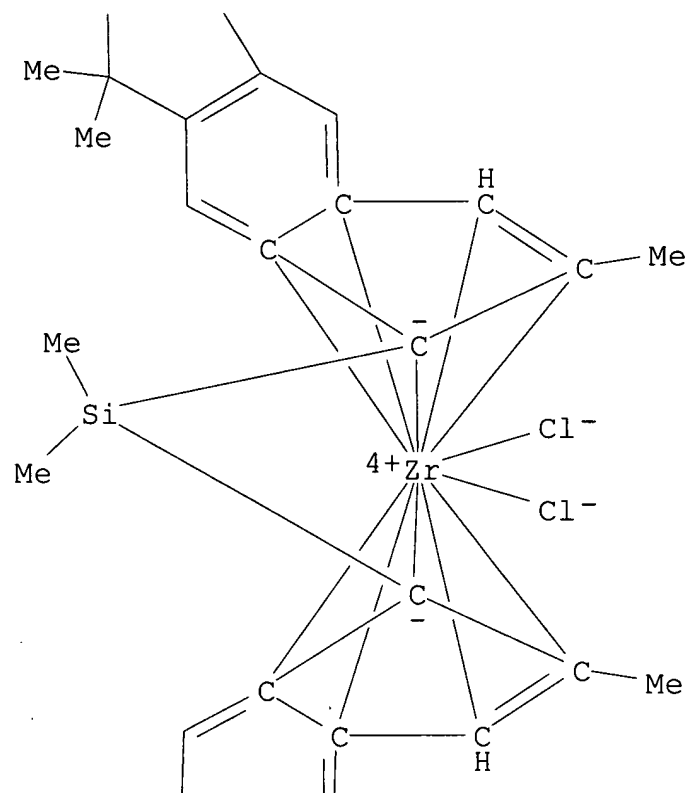
RN 704892-49-9 ZCAPLUS

CN Zirconium, dichloro[rel-(1R,1'R)-(dimethylsilylene)bis[(1,2,3,3a,8a-eta.)-6,7-dihydro-2,5,5,7,7-pentamethyl-s-indacen-1(5H)-ylidene]]-(9CI) (CA INDEX NAME)

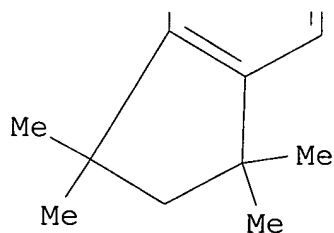
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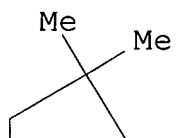


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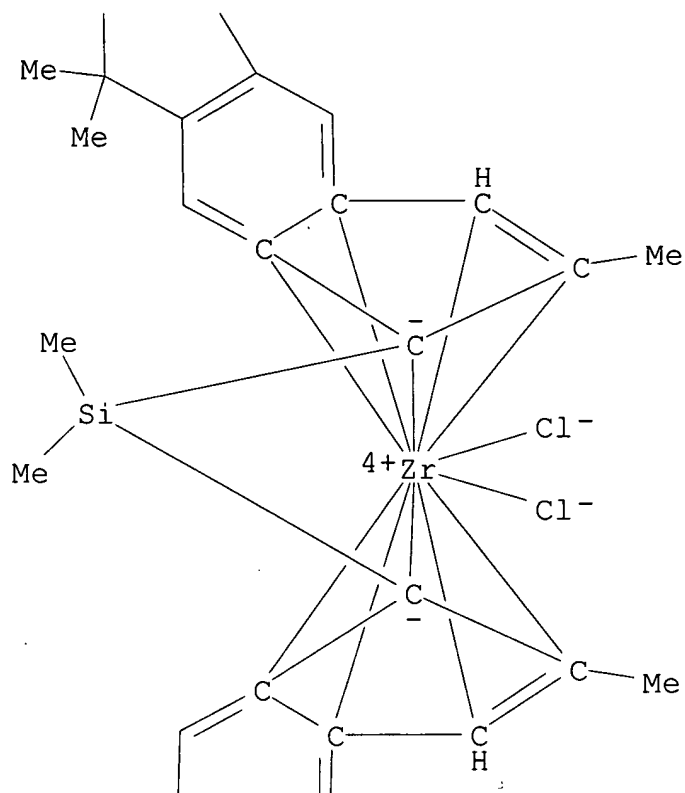


RN 704892-50-2 ZCAPLUS  
 CN Zirconium, dichloro[rel-(1R,1'S)-(dimethylsilylene)bis[(1,2,3,3a,8a-  
 .eta.)-6,7-dihydro-2,5,5,7,7-pentamethyl-s-indacen-1(5H)-ylidene]]-  
 (9CI) (CA INDEX NAME)

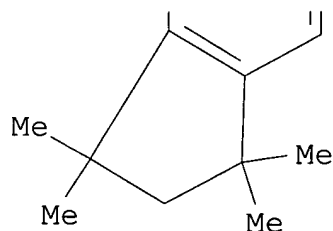
PAGE 1-A



PAGE 2-A



PAGE 3-A



IT 704892-49-9P 704892-50-2P

(prepn. of indenyl-contg. metallocene catalyst for 1-butene  
polymn.)

REFERENCE COUNT:

5

THERE ARE 5 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L9 ANSWER 4 OF 8 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:805469 ZCAPLUS  
DOCUMENT NUMBER: 134:71943  
TITLE: Theoretical Study on the Factors Controlling the  
Accessibility of Cationic Metal Centers in  
Zirconocene Polymerization Catalysts  
AUTHOR(S): Linnolahti, Mikko; Pakkanen, Tapani A.  
CORPORATE SOURCE: Department of Chemistry, University of Joensuu,  
Joensuu, FIN-80101, Finland  
SOURCE: Macromolecules (2000), 33(25), 9205-9214  
CODEN: MAMOBX; ISSN: 0024-9297  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English

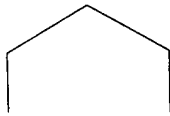
AB The influence of the ligand structure of zirconocene polymn.  
catalysts on the accessibility of the active reaction center was  
studied by an ab initio Hartree-Fock method. The variations in the  
accessibility were elucidated by comparing mol. structures and  
relative stabilities of 54 bridged zirconocene catalysts with 19  
different bridging units, 18 ancillary Cp' ligands, and 18 ligand  
substituents. Ligand variations gave rise to various steric and  
electronic effects affecting both the nature and the concn. of  
active metal centers in the system, such as steric blocking or  
shielding of the metal center, and stabilization or destabilization  
of the active cationic species. Comparisons to exptl. work  
demonstrated clear correlations between accessibility of the active  
reaction center and obsd. polymn. activity. Furthermore,  
interactions between the Lewis acidic Al centers and Lewis basic  
functionalities were obsd. The consequences of such interactions  
are discussed.

IT **315686-87-4**  
(theor. study on factors controlling accessibility of cationic  
metal centers in zirconocene polymn. catalysts)

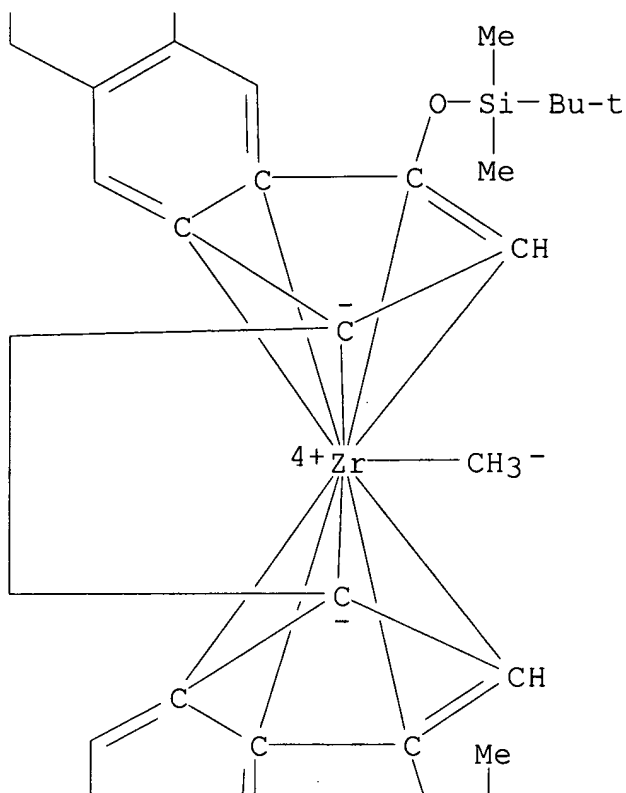
RN 315686-87-4 ZCAPLUS

CN Zirconium(1+), [1,2-ethanediylbis[(1,2,3,3a,9a-.eta.)-3-[[[(1,1-  
dimethylethyl)dimethylsilyl]oxy]-5,6,7,8-tetrahydro-1H-benz[f]inden-  
1-ylidene]]methyl- (9CI) (CA INDEX NAME)

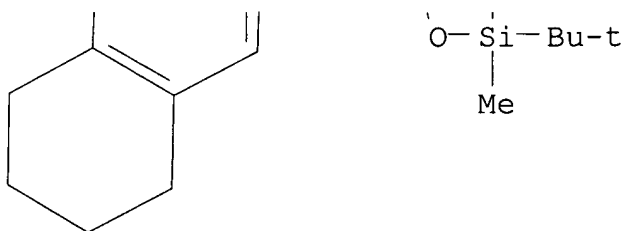
PAGE 1-A



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PAGE 3-A



IT 315686-87-4

(theor. study on factors controlling accessibility of cationic metal centers in zirconocene polymn. catalysts)

REFERENCE COUNT: 139 THERE ARE 139 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 5 OF 8 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:421193 ZCAPLUS  
 DOCUMENT NUMBER: 133:59935  
 TITLE: Ligands and catalysts for producing elastomeric propylene polymers  
 INVENTOR(S): Ernst, Andreas P.; Moore, Eric J.; Myers, Charles L.; Quan, Roger W.  
 PATENT ASSIGNEE(S): Bp Amoco Corporation, USA  
 SOURCE: PCT Int. Appl., 41 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000035975	A1	20000622	WO 1999-US29616	19991214
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6479424	B1	20021112	US 1999-459732	19991213
CA 2355236	AA	20000622	CA 1999-2355236	19991214
EP 1157047	A1	20011128	EP 1999-967306	19991214
EP 1157047	B1	20030423		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
AT 238359	E	20030515	AT 1999-967306	19991214
PRIORITY APPLN. INFO.:				19981214
US 1998-112383P				P

WO 1999-US29616

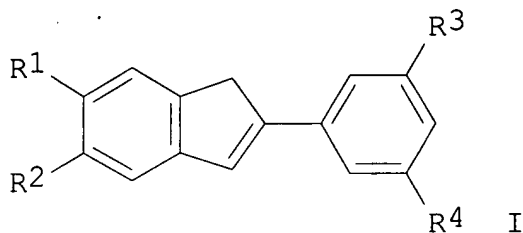
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199912

14

OTHER SOURCE(S):  
GI

MARPAT 133:59935



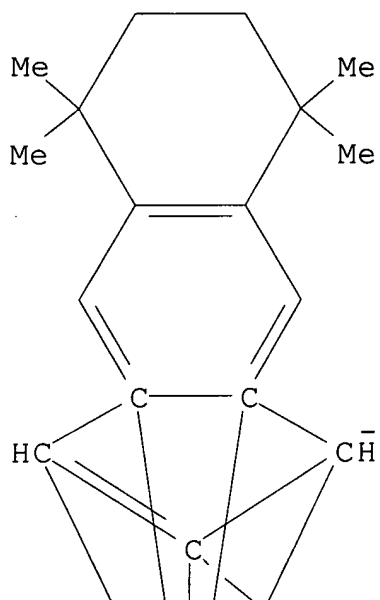
AB A ligand I is useful to form a metallocene olefin polymn. catalyst, where at least R3 and R4 are substituents having at least a bulk of a tert-Bu group and, optionally, where R1 or R2 may be a bulky substituent group. Thus, bis(2-(3,5-tert-Bu<sub>2</sub>)PhInd)2HfCl<sub>2</sub> soln. (0.25 g contg. 1.17 x 10<sup>-3</sup> mmol Hf-tert-Bu<sub>2</sub>) was added to 3.8 g and the combined soln. then is added to 0.24 g DMAO soln. (30% Albemarle DMAO in 13.1 % Al, giving [Al]/[Hf] = 1000). At 50.degree./100 psi, propylene was polymd. 30 min using this catalyst soln. to give 4.5 g product elastomer.

IT **276890-37-0P**, Bis(2-(3,5-di-tert-butylphenyl)-5,5,8,8-tetramethyl-5,6,7,8-tetrahydrobenz(f)indenyl)hafnium dichloride  
**276890-38-1P**, Bis(2-(3,5-di-tert-butylphenyl)-5,5,8,8-tetramethyl-5,6,7,8-tetrahydrobenz(f)indenyl) zirconium dichloride  
 (metallocene catalysts for producing elastomeric propylene polymers)

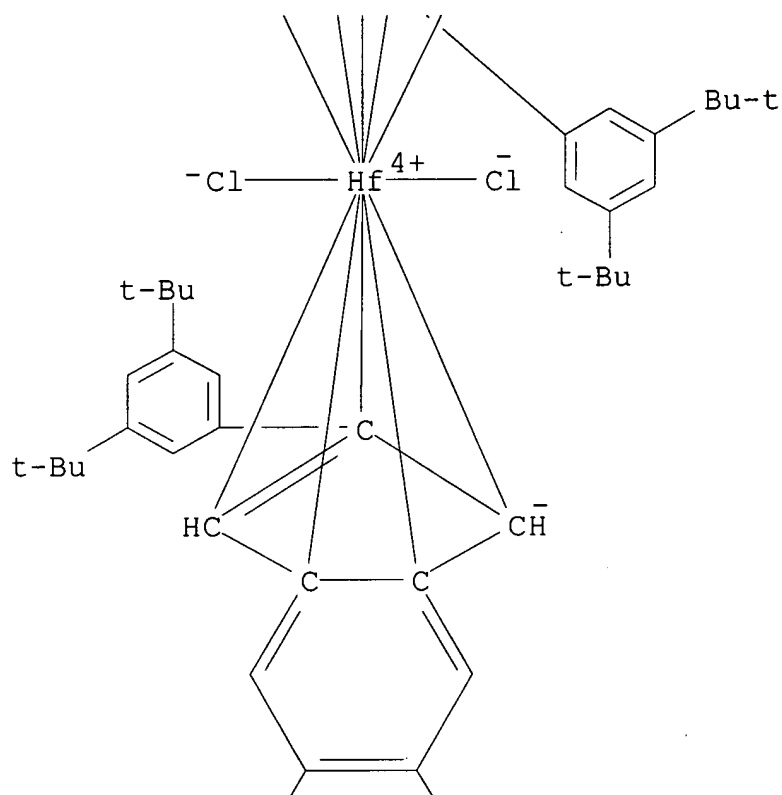
RN 276890-37-0 ZCAPLUS

CN Hafnium, bis[(1,2,3,3a,9a-.eta.)-2-[3,5-bis(1,1-dimethylethyl)phenyl]-5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-1H-benz[f]inden-1-yl]dichloro- (9CI) (CA INDEX NAME)

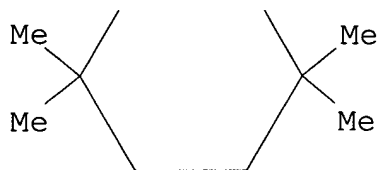
PAGE 1-A



PAGE 2-A

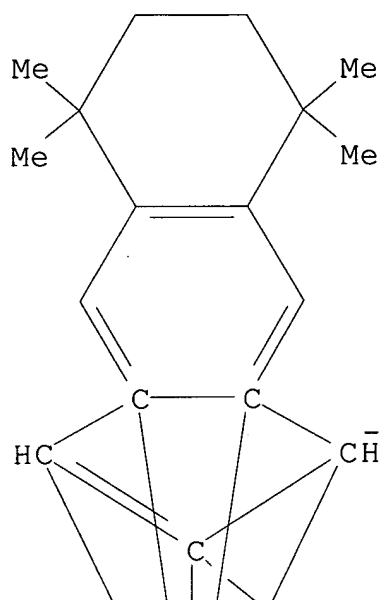


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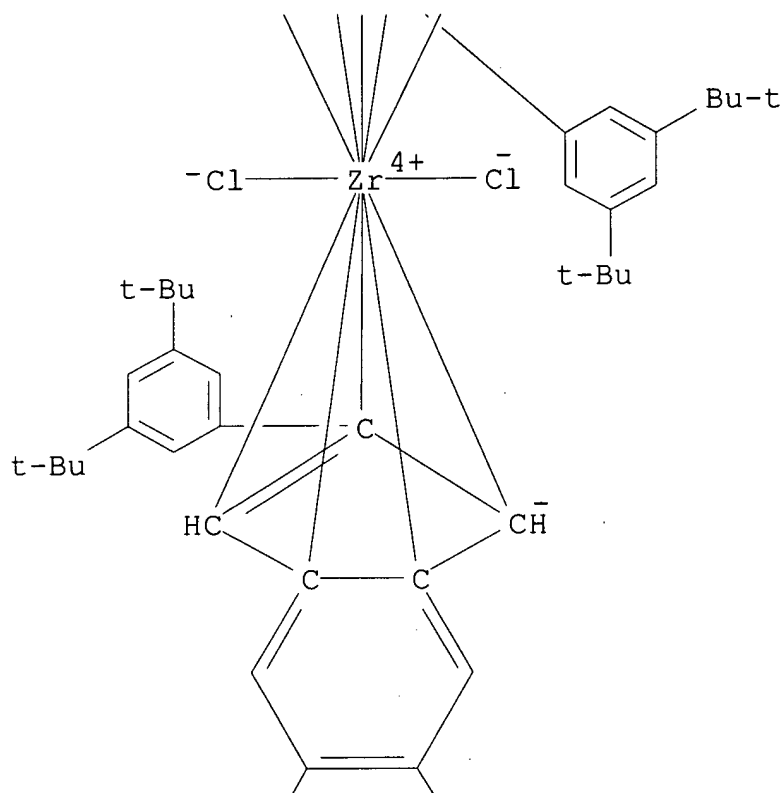


RN 276890-38-1 ZCAPLUS  
 CN Zirconium, bis[(1,2,3,3a,9a-.eta.)-2-[3,5-bis(1,1-dimethylethyl)phenyl]-5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-1H-benz[f]inden-1-yl]dichloro- (9CI) (CA INDEX NAME)

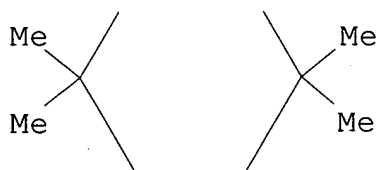
PAGE 1-A



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PAGE 3-A



IT **276890-37-0P**, Bis(2-(3,5-di-tert-butylphenyl)-5,5,8,8-tetramethyl-5,6,7,8-tetrahydrobenz(f)indenyl)hafnium dichloride  
**276890-38-1P**, Bis(2-(3,5-di-tert-butylphenyl)-5,5,8,8-tetramethyl-5,6,7,8-tetrahydrobenz(f)indenyl) zirconium dichloride  
 (metallocene catalysts for producing elastomeric propylene polymers)

REFERENCE COUNT:

4

THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 6 OF 8 ZCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 1999:595183 ZCAPLUS  
 DOCUMENT NUMBER: 131:243745  
 TITLE: Integrated preparation of diene complexes for  
 catalysts for olefin polymerization  
 INVENTOR(S): Chen, Eugene Y.; Campbell, Richard E., Jr.;  
 Devore, David D.; Green, Daniel Patrick; Patton,  
 Jasson T.; Soto, Jorge; Wilson, David R.  
 PATENT ASSIGNEE(S): The Dow Chemical Company, USA  
 SOURCE: PCT Int. Appl., 44 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9946270	A1	19990916	WO 1999-US5230	19990310
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
CA 2322324	AA	19990916	CA 1999-2322324	19990310
AU 9929032	A1	19990927	AU 1999-29032	19990310
US 6084115	A	20000704	US 1999-265641	19990310
BR 9908807	A	20001031	BR 1999-8807	19990310
EP 1062219	A1	20001227	EP 1999-909951	19990310
EP 1062219	B1	20020828		
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PT, IE, FI					
JP 2002506074	T2	20020226	JP 2000-535647		199903 10
AT 222913	E	20020915	AT 1999-909951		199903 10
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			US 1998-91207P	P	199806 30
			US 1999-265641	A3	199903 10
			WO 1999-US5230	W	199903 10

## OTHER SOURCE(S): MARPAT 131:243745

AB Bridged Group 4 metal complexes contg. a neutral diene ligand are made starting from the metal diene contg. complex by reaction with the divalent deriv. of a bridged bidentate ligand compd. Thus, ethylene and 1-octene were polymd. in alkane solvent in the presence of rac dimethylsilanebis(2-methyl-4-phenylinden-1-yl)zirconium(II) 1,4-diphenyl-1,3-butadiene and cocatalyst at 140.degree..

IT **244146-41-6 244146-42-7 244146-43-8**  
**244146-44-9 244146-50-7 244146-51-8**  
**244146-52-9 244146-53-0 244146-64-3**  
**244146-65-4 244146-66-5 244146-67-6**  
**244146-77-8 244146-78-9 244146-79-0**  
**244146-81-4 244146-96-1 244146-97-2**

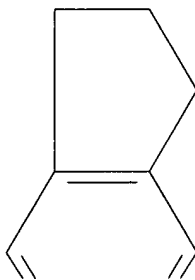
**244146-98-3 244146-99-4 244147-10-2****244147-11-3 244147-12-4 244147-13-5**

(for olefin polymn. and manuf. of polyolefin having high mol. wt.  
and high comonomer incorporation even at high polymn. temp.)

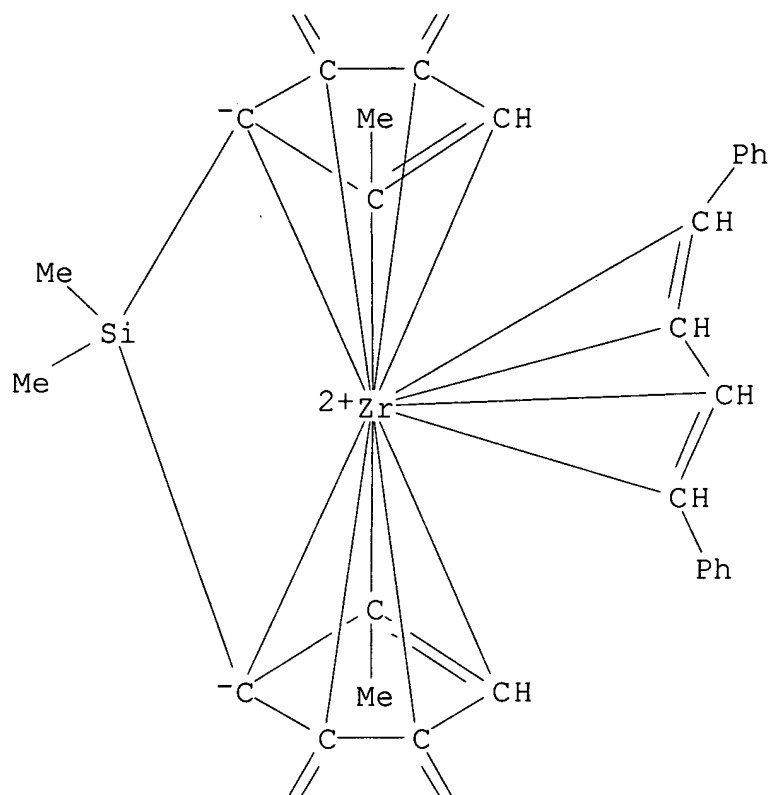
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CN Zirconium, [1,1'-(.eta.4-1,3-butadiene-1,4-  
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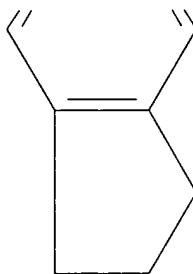
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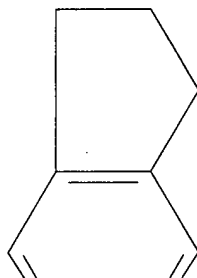


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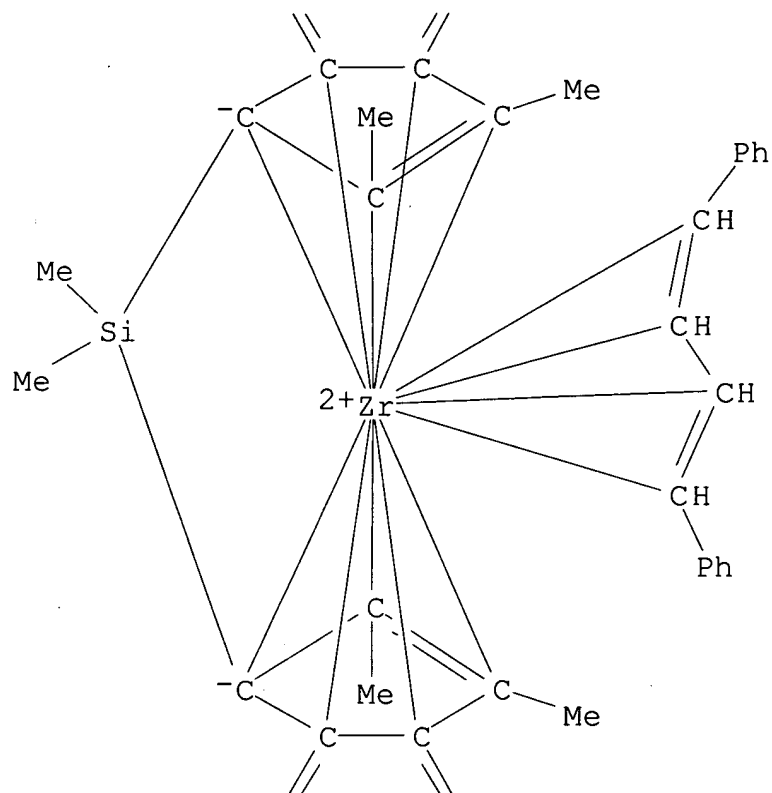


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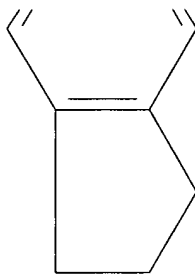
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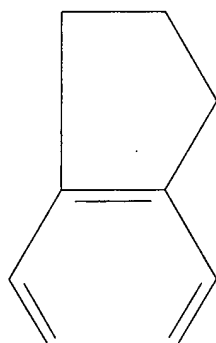


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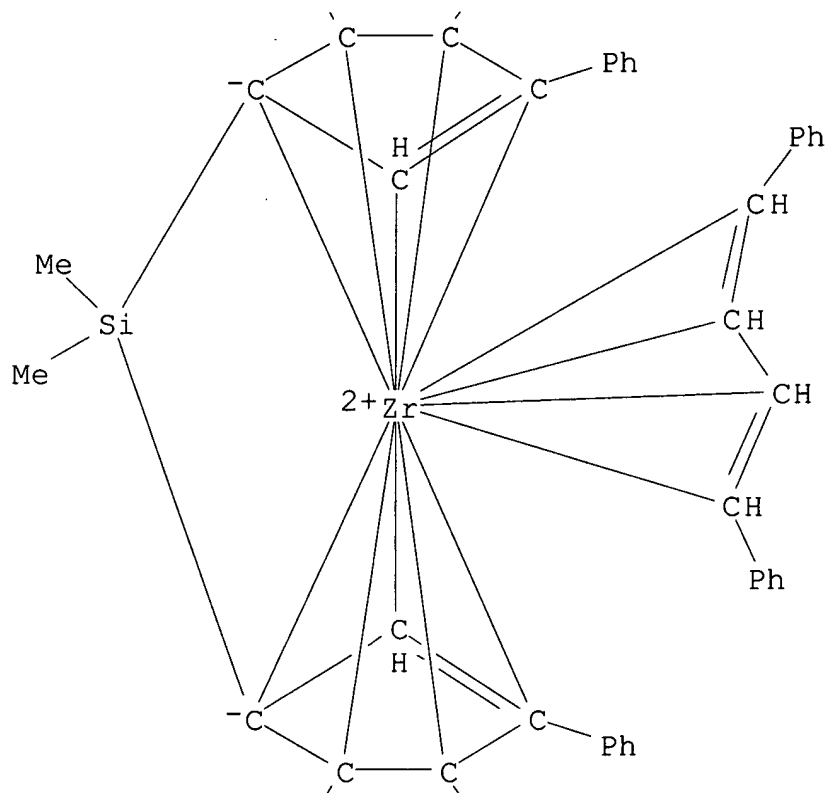


RN 244146-43-8 ZCAPLUS  
 CN Zirconium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][(dimethylsilylene)bis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-3-phenyl-s-indacen-1(5H)-ylidene]]- (9CI) (CA INDEX NAME)

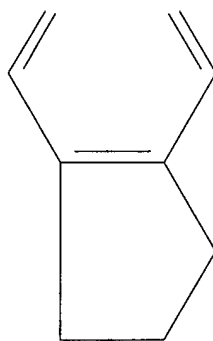
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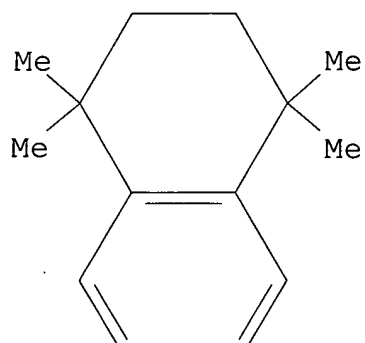


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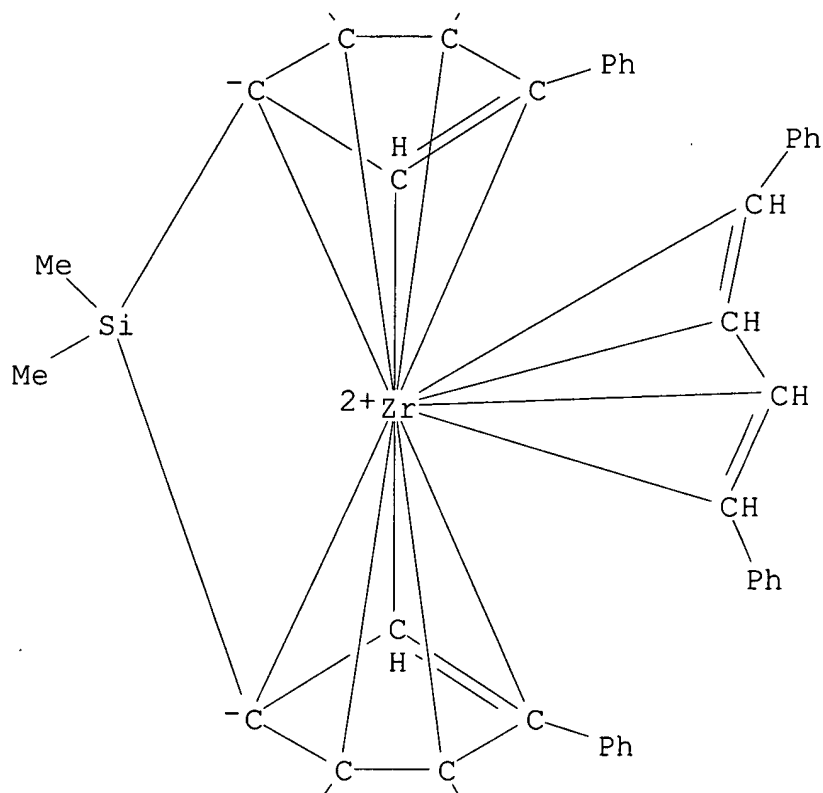


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 CN Zirconium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][(dimethylsilylene)bis[(1,2,3,3a,9a-.eta.)-5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-3-phenyl-1H-benz[f]inden-1-ylidene]]-(9CI) (CA INDEX NAME)

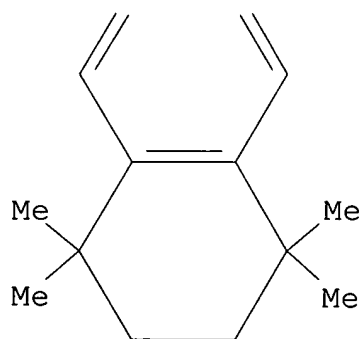
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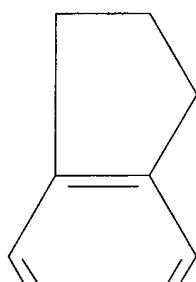


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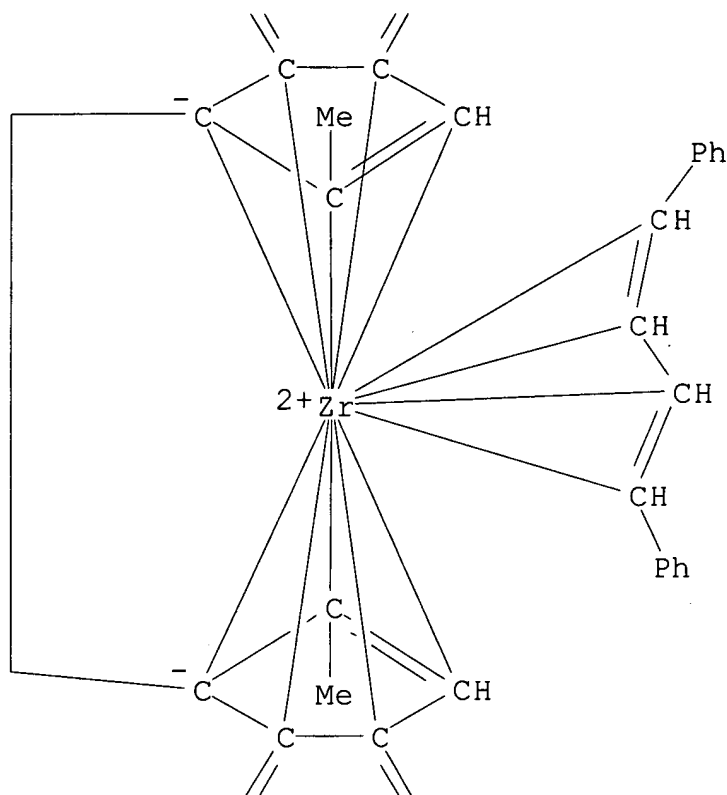


RN 244146-50-7 ZCAPLUS  
 CN Zirconium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis(benzene)][1,2-ethanediylbis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-2-methyl-s-indacen-1(5H)-ylidene]]- (9CI) (CA INDEX NAME)

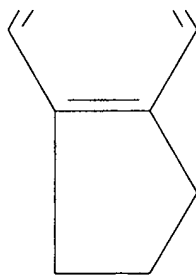
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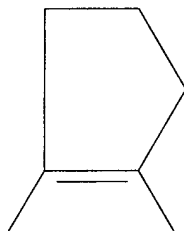


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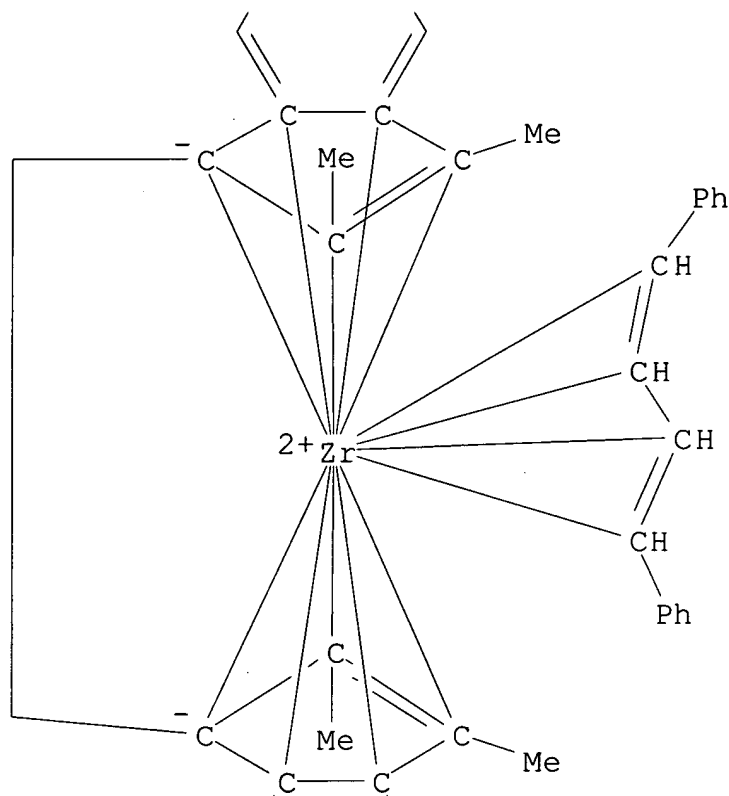


RN 244146-51-8 ZCAPLUS  
 CN Zirconium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][1,2-ethanediylbis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-2,3-dimethyl-s-indacen-1(5H)-ylidene]]- (9CI) (CA INDEX NAME)

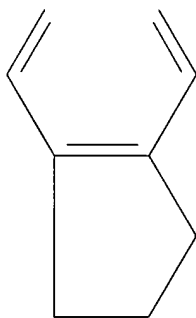
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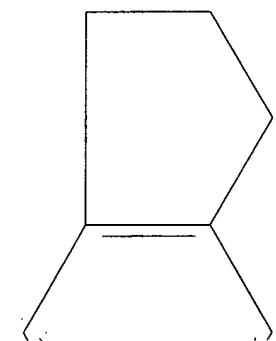


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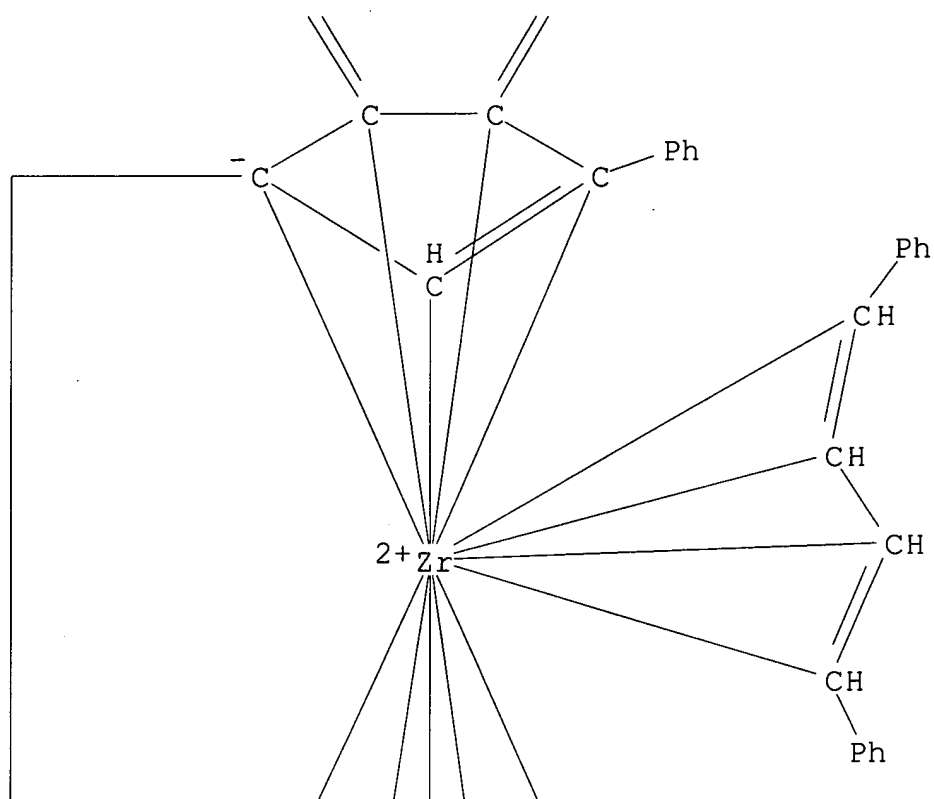


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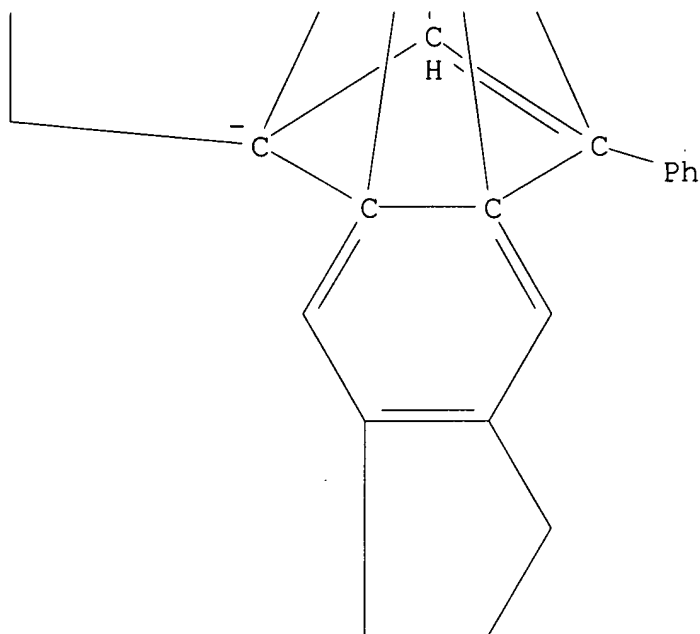
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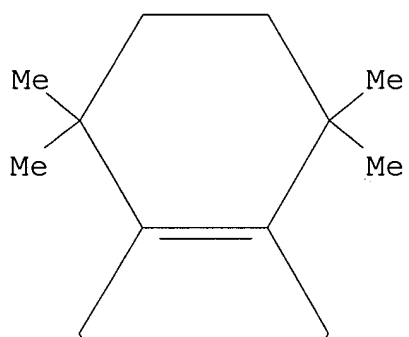


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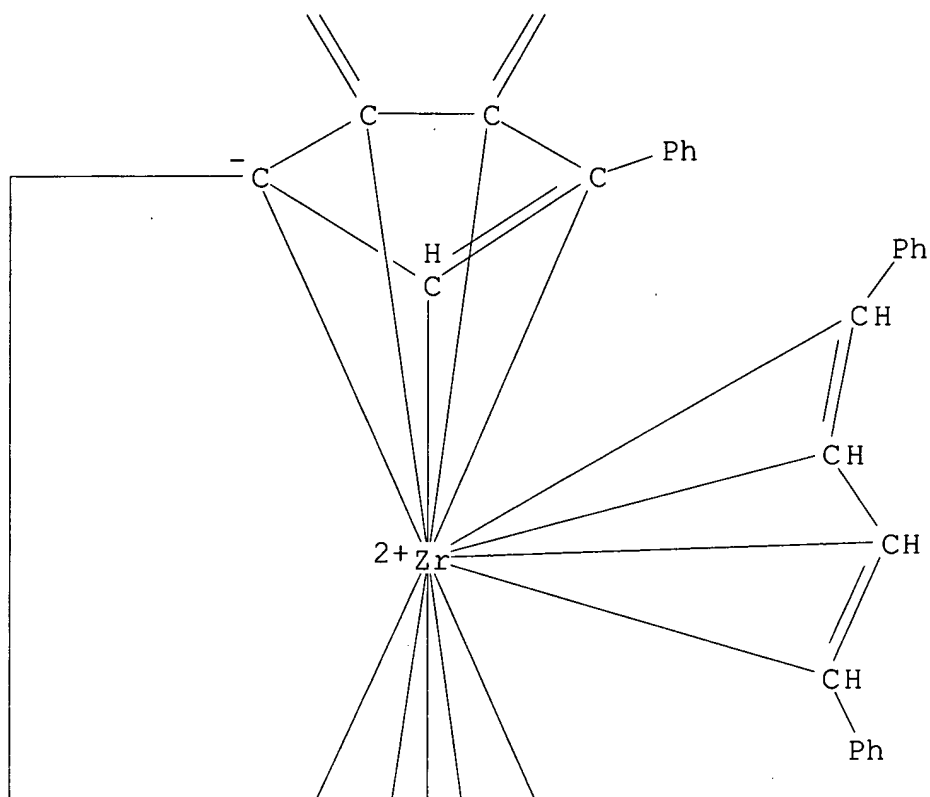


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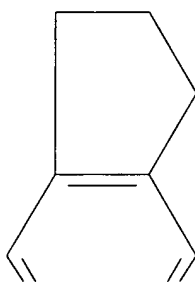


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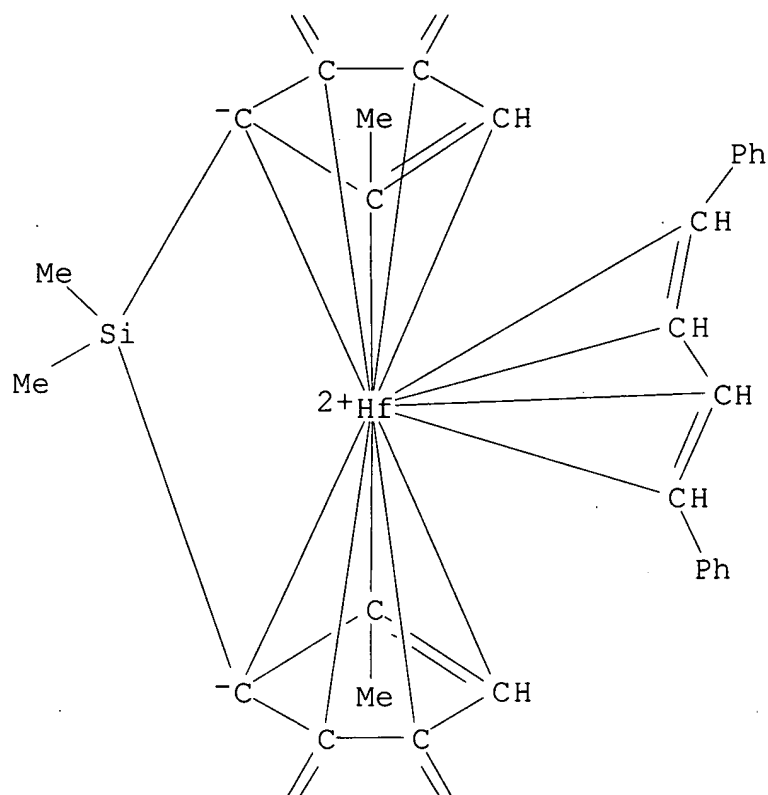




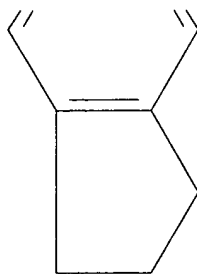
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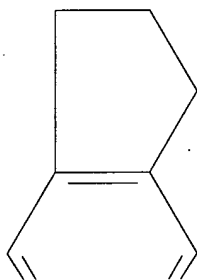


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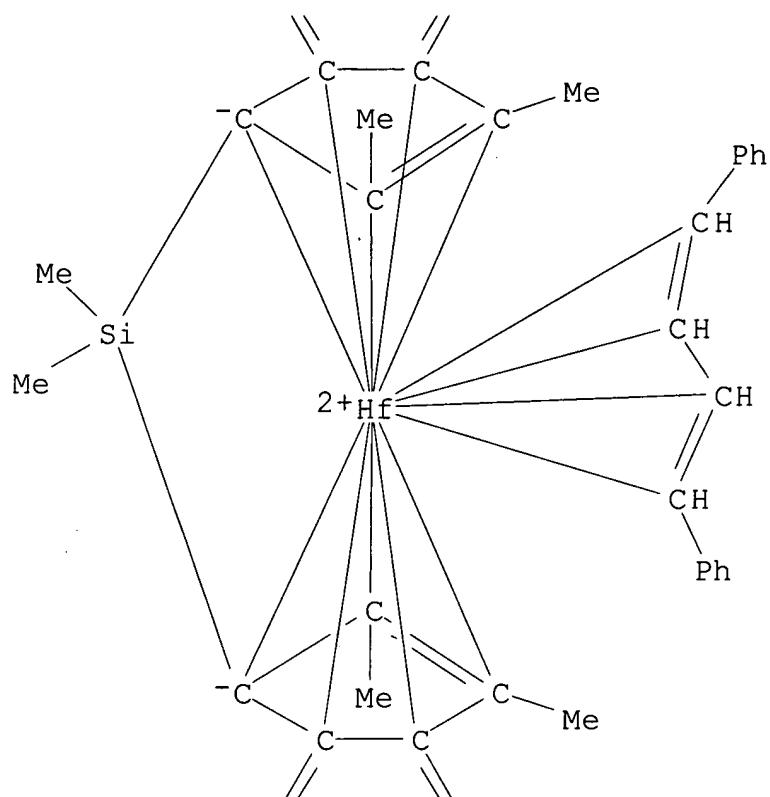


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 diyl)bis[benzene]][(dimethylsilylene)bis[(1,2,3,3a,8a-.eta.)-6,7-  
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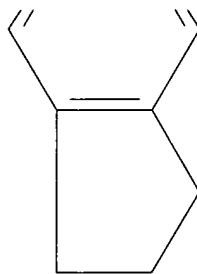
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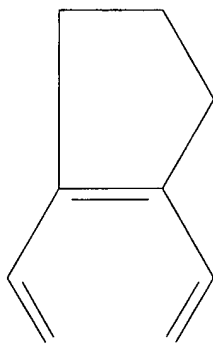


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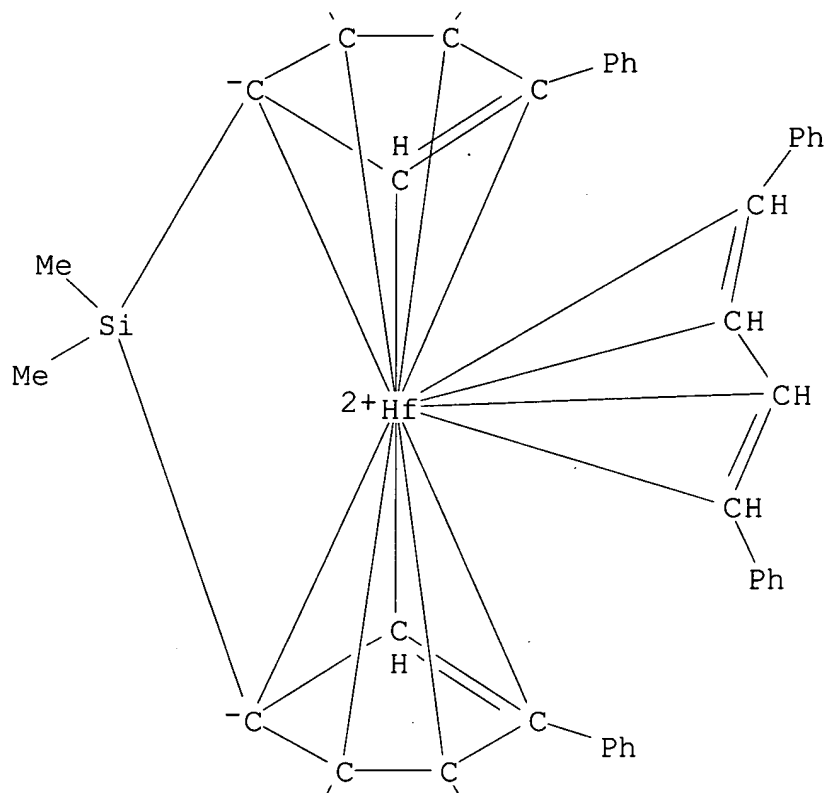


RN 244146-66-5 ZCAPLUS  
 CN Hafnium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][(dimethylsilylene)bis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-3-phenyl-s-indacen-1(5H)-ylidene]]- (9CI) (CA INDEX NAME)

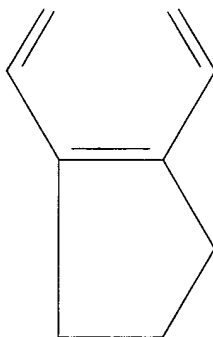
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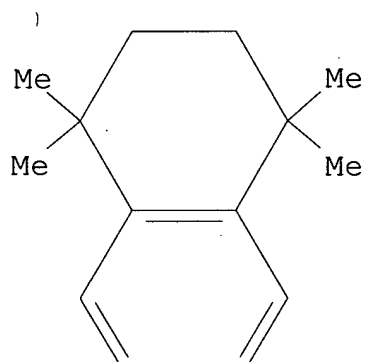


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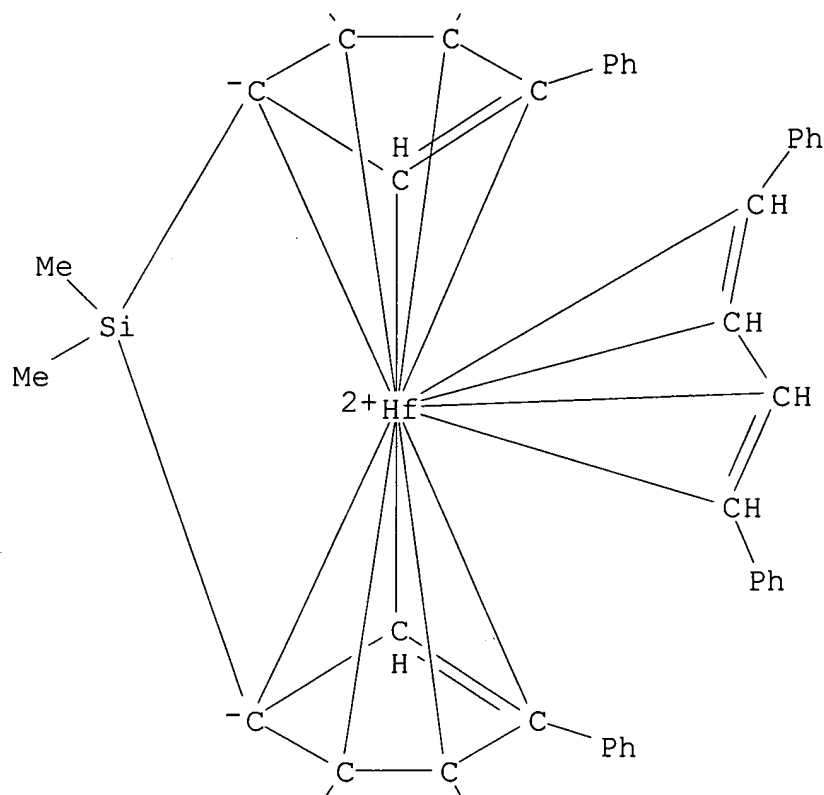


RN 244146-67-6 ZCAPLUS  
 CN Hafnium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][(dimethylsilylene)lbis[(1,2,3,3a,9a-.eta.)-5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-3-phenyl-1H-benz[f]inden-1-ylidene]]- (9CI) (CA INDEX NAME)

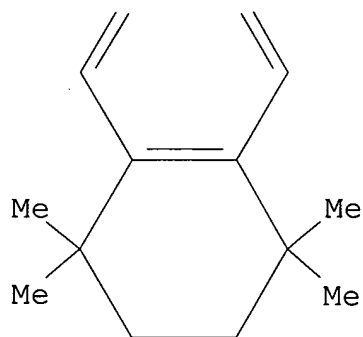
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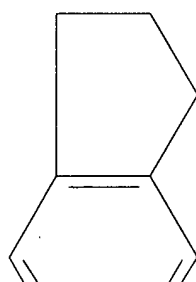


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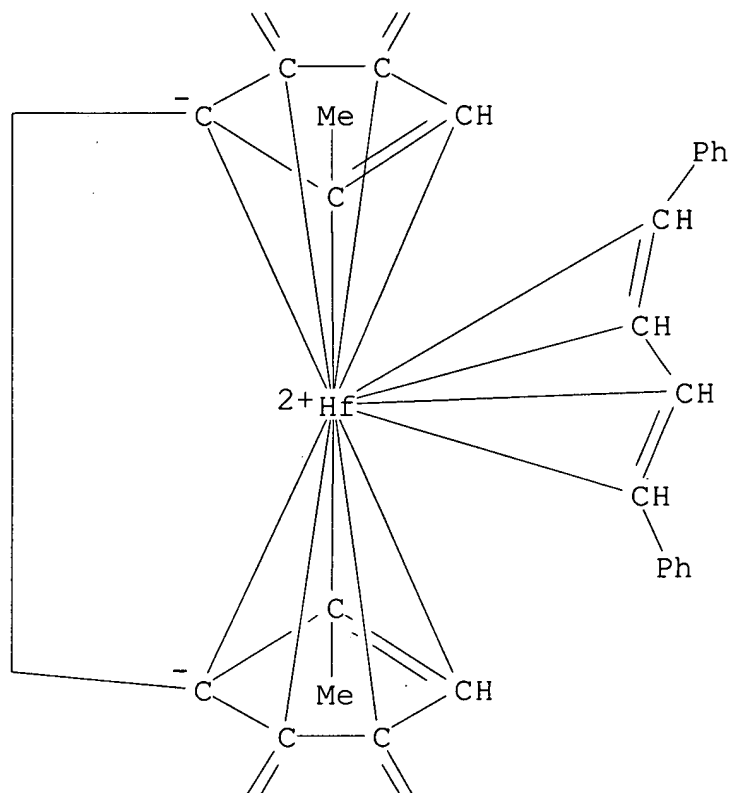


RN 244146-77-8 ZCAPLUS  
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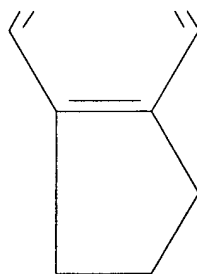
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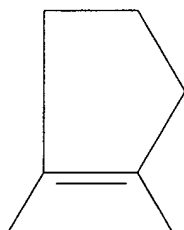


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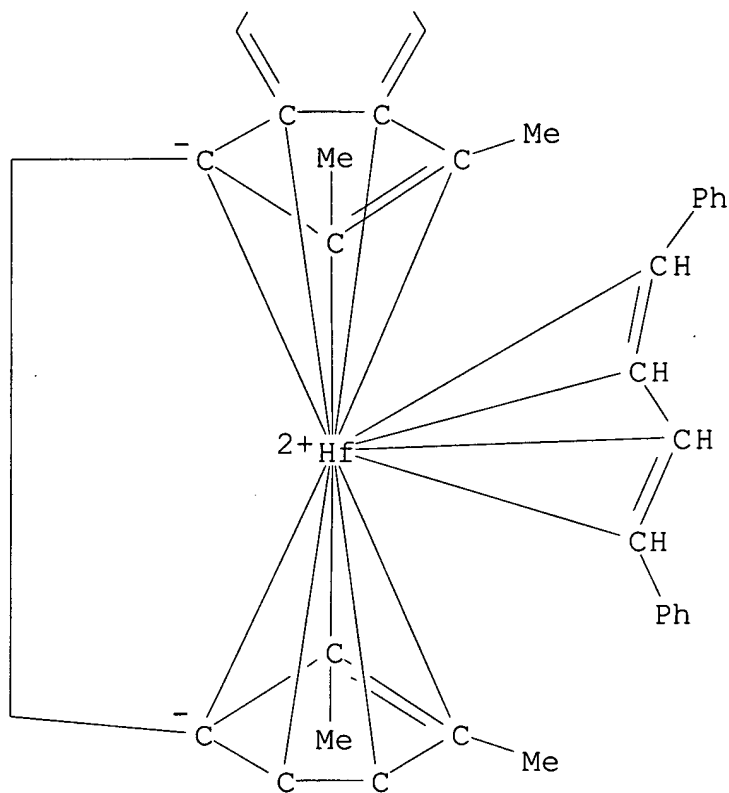


RN 244146-78-9 ZCAPLUS  
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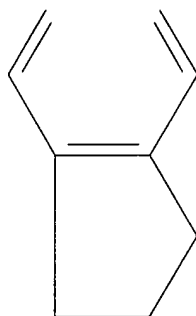
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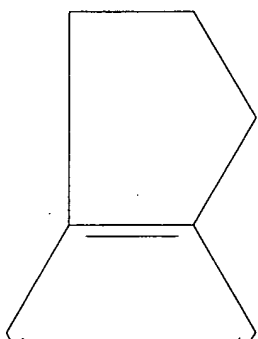


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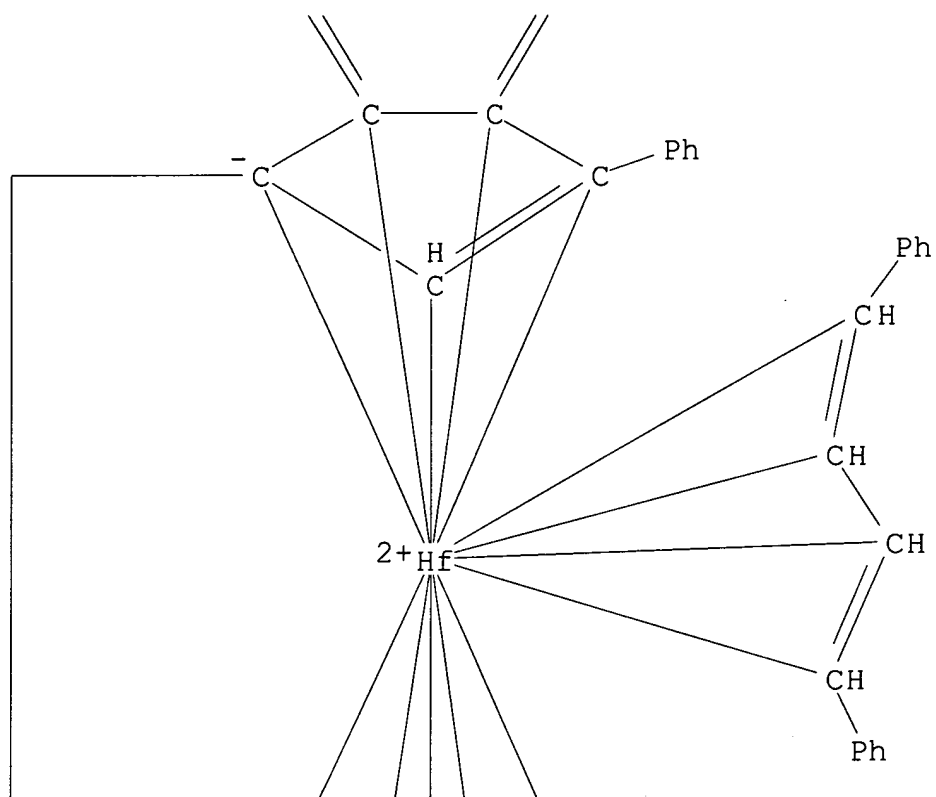


RN 244146-79-0 ZCAPLUS  
 CN Hafnium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][1,2-ethanediylbis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-3-phenyl-s-indacen-1(5H)-ylidene]]- (9CI) (CA INDEX NAME)

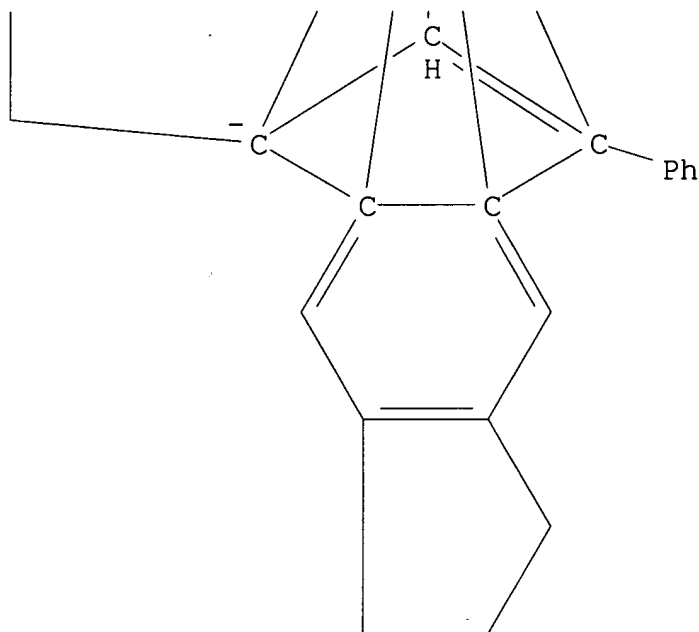
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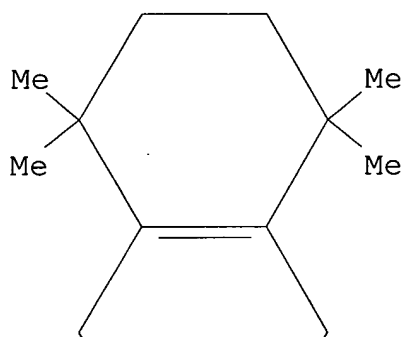


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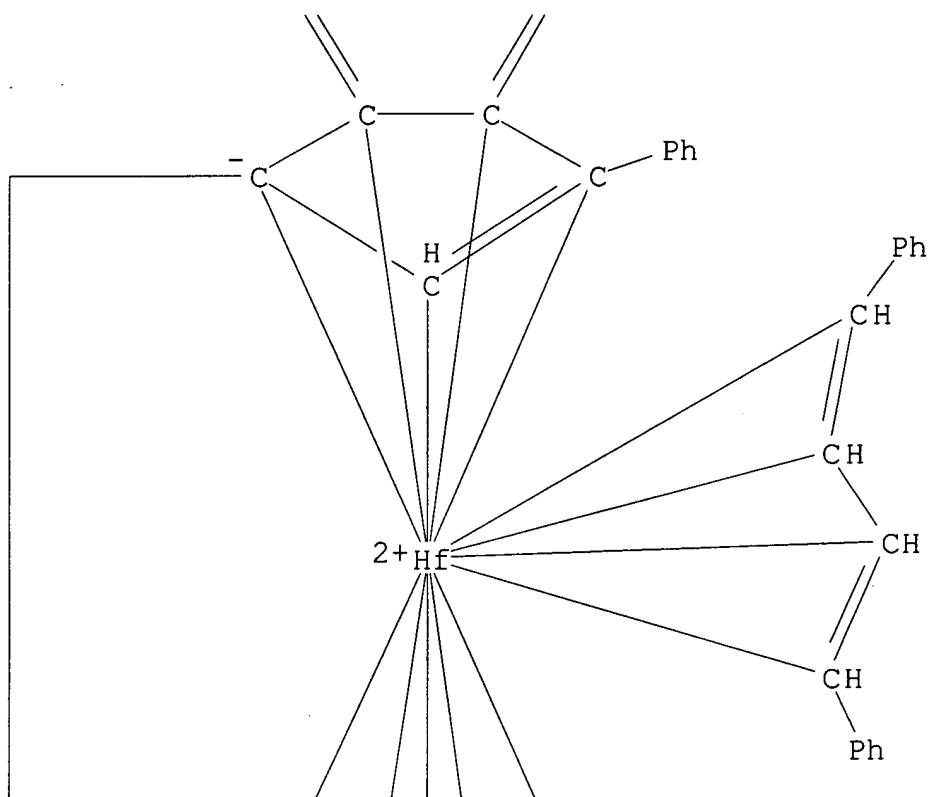


RN 244146-81-4 ZCAPLUS  
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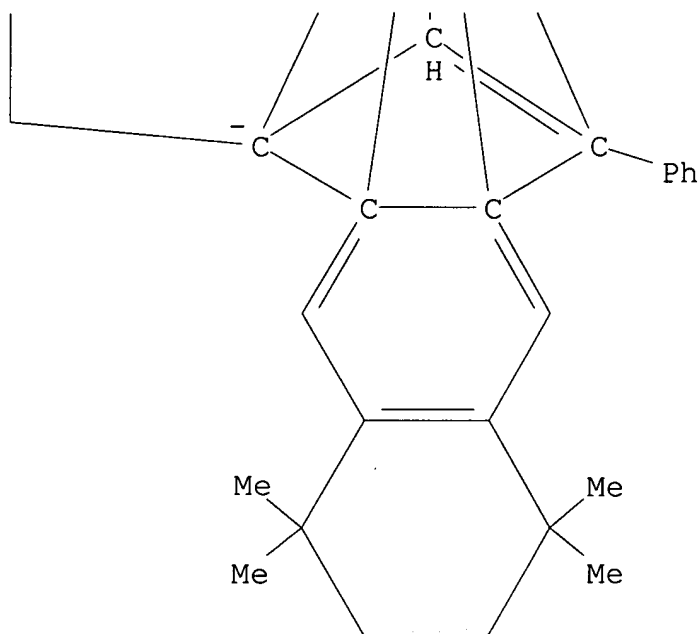
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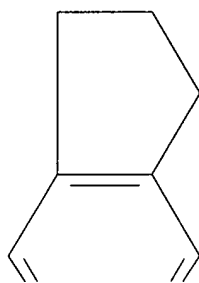


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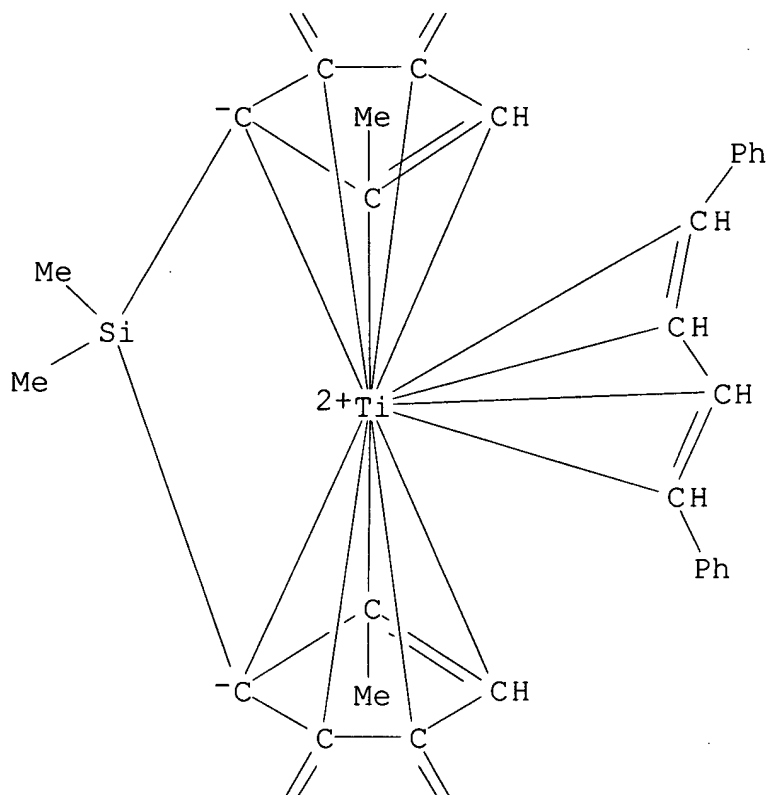


RN 244146-96-1 ZCAPLUS  
 CN Titanium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][(dimethylsilylene)bis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-2-methyl-s-indacen-1(5H)-ylidene]]- (9CI) (CA INDEX NAME)

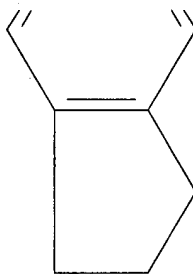
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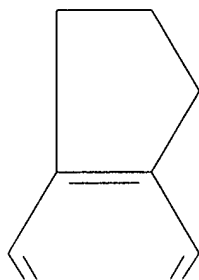


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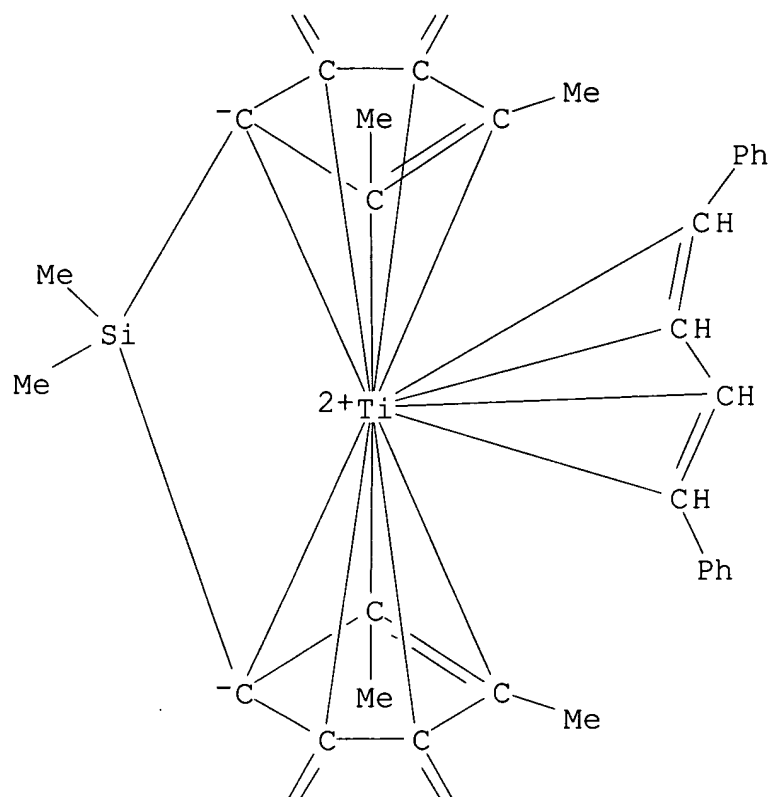


RN 244146-97-2 ZCAPLUS  
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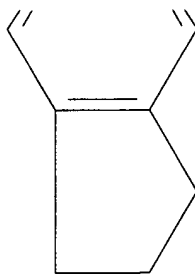
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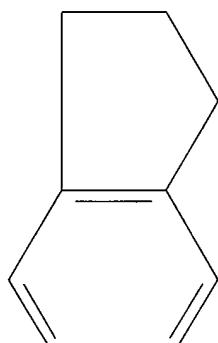


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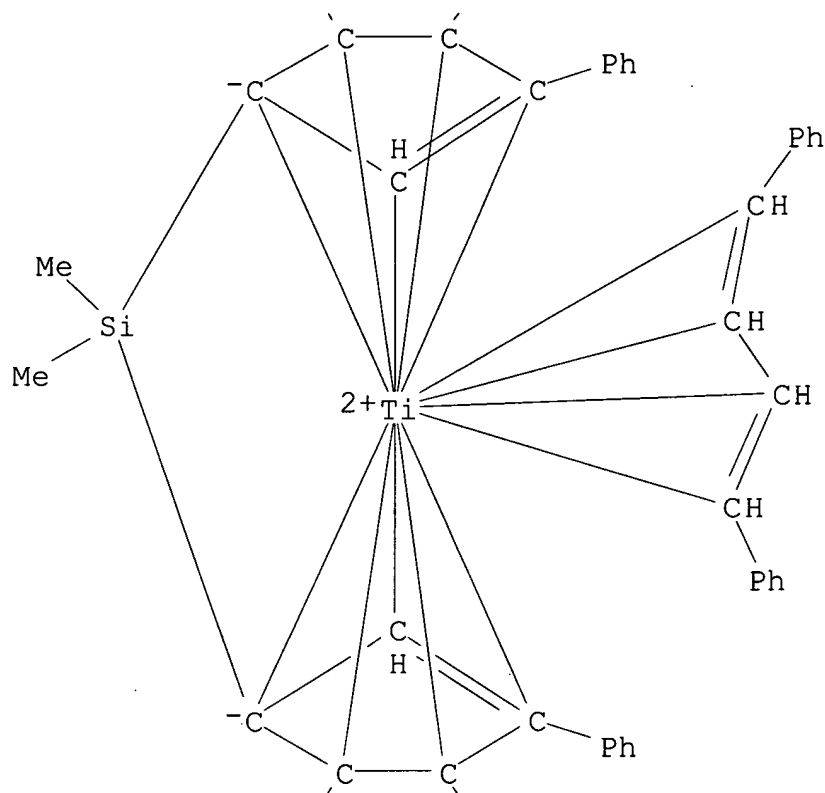


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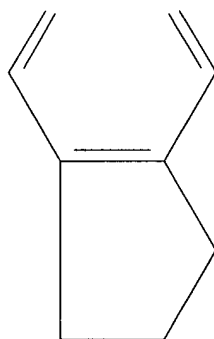
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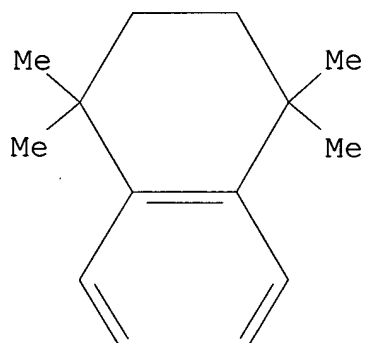


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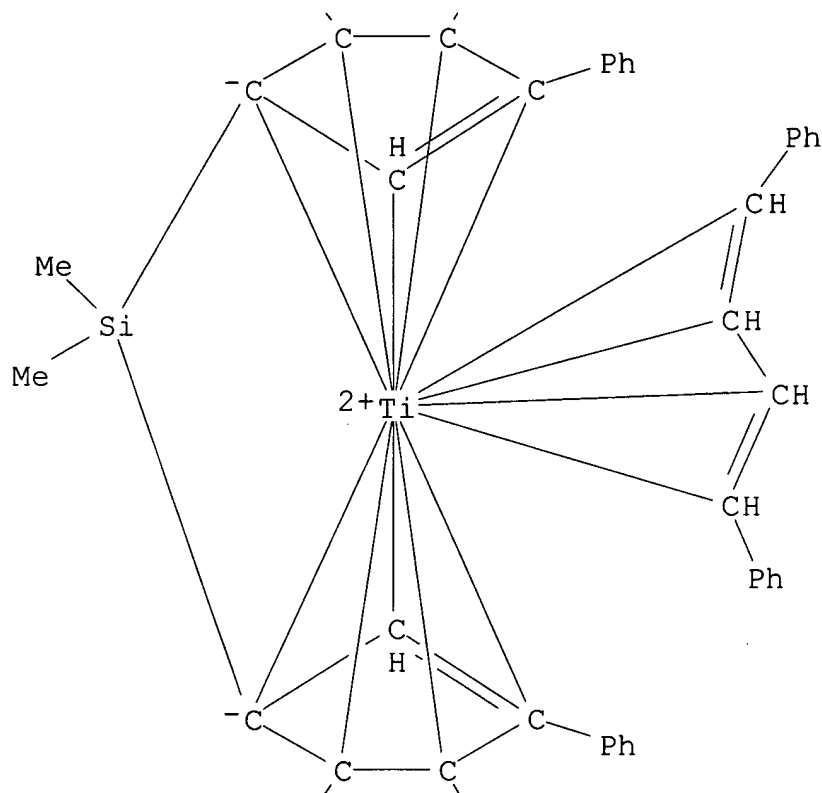


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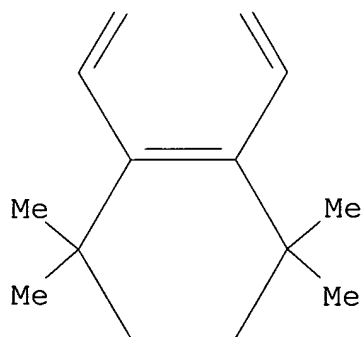
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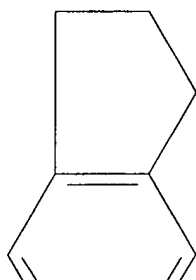


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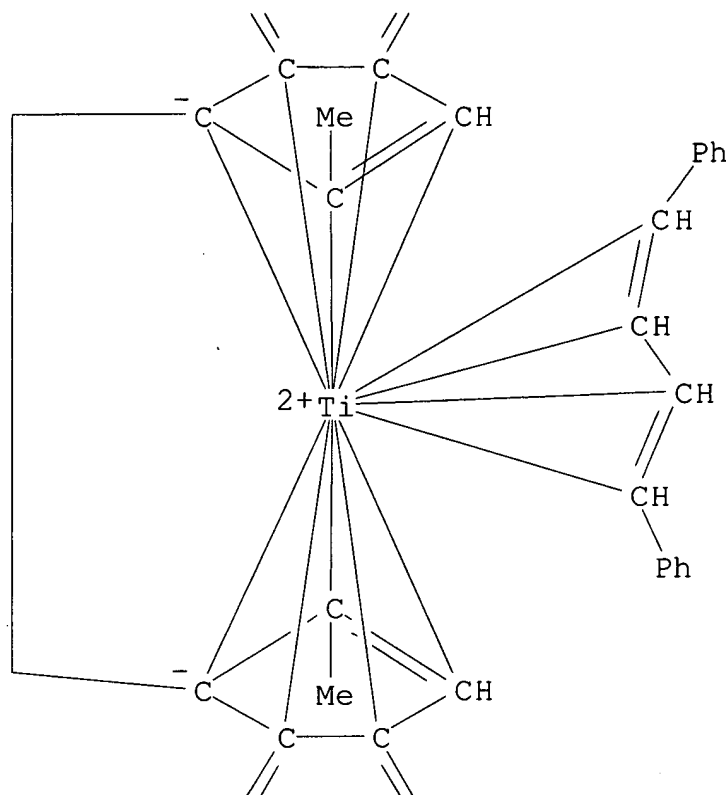


RN 244147-10-2 ZCAPLUS  
 CN Titanium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][1,2-ethanediylbis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-2-methyl-s-indacen-1(5H)-ylidene]]- (9CI) (CA INDEX NAME)

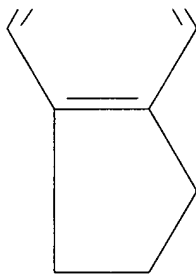
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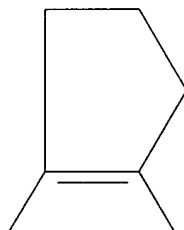


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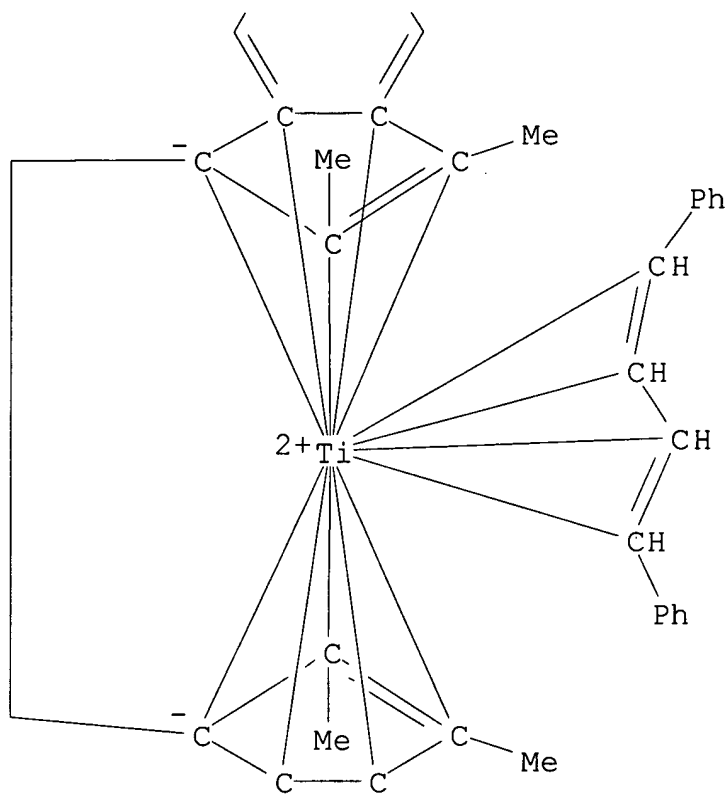


RN 244147-11-3 ZCAPLUS  
 CN Titanium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][1,2-ethanediylbis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-2,3-dimethyl-s-indacen-1(5H)-ylidene]]- (9CI) (CA INDEX NAME)

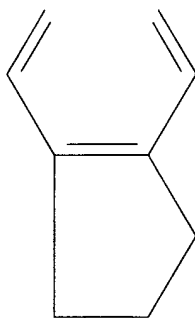
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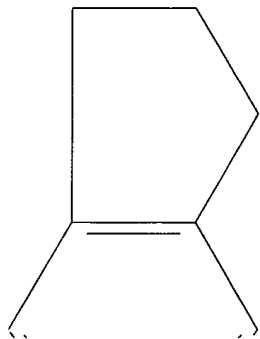


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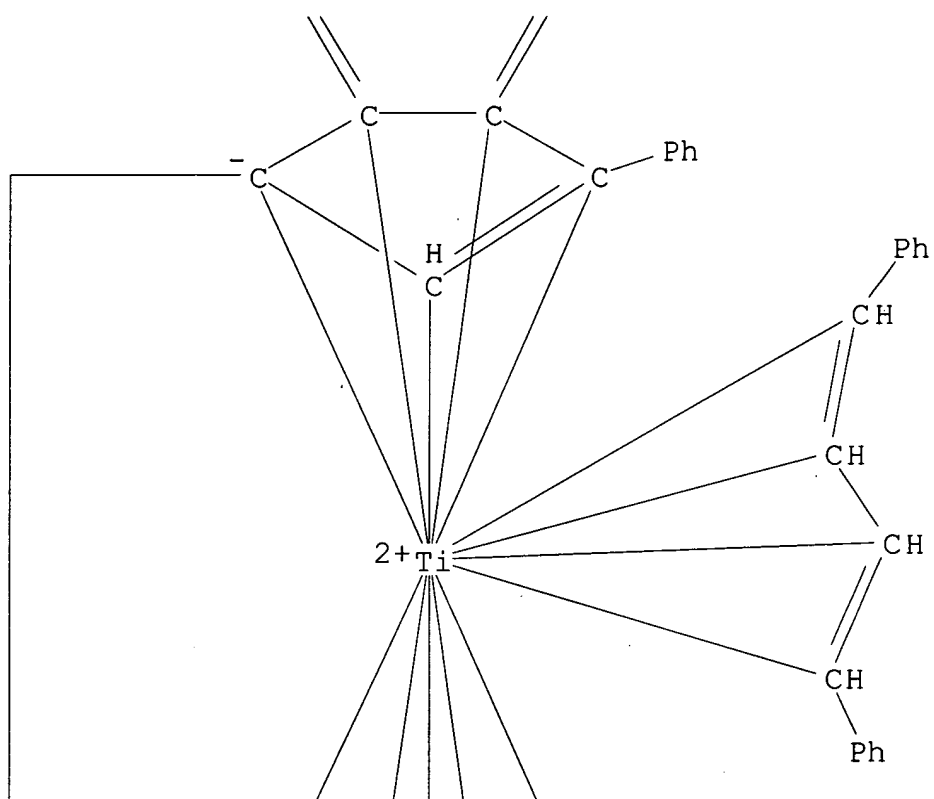


RN 244147-12-4 ZCAPLUS  
 CN Titanium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][1,2-ethanediylbis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-3-phenyl-s-indacen-1(5H)-ylidene]]- (9CI) (CA INDEX NAME)

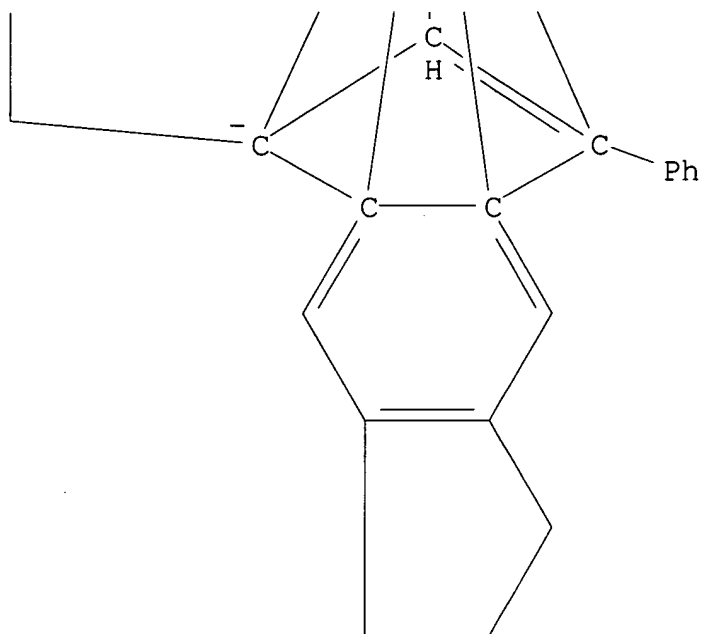
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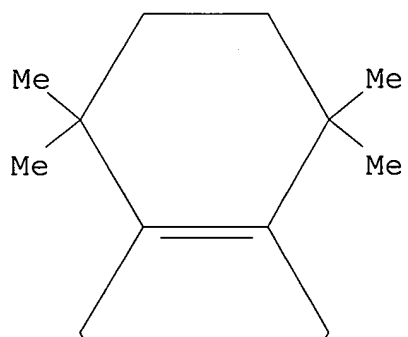


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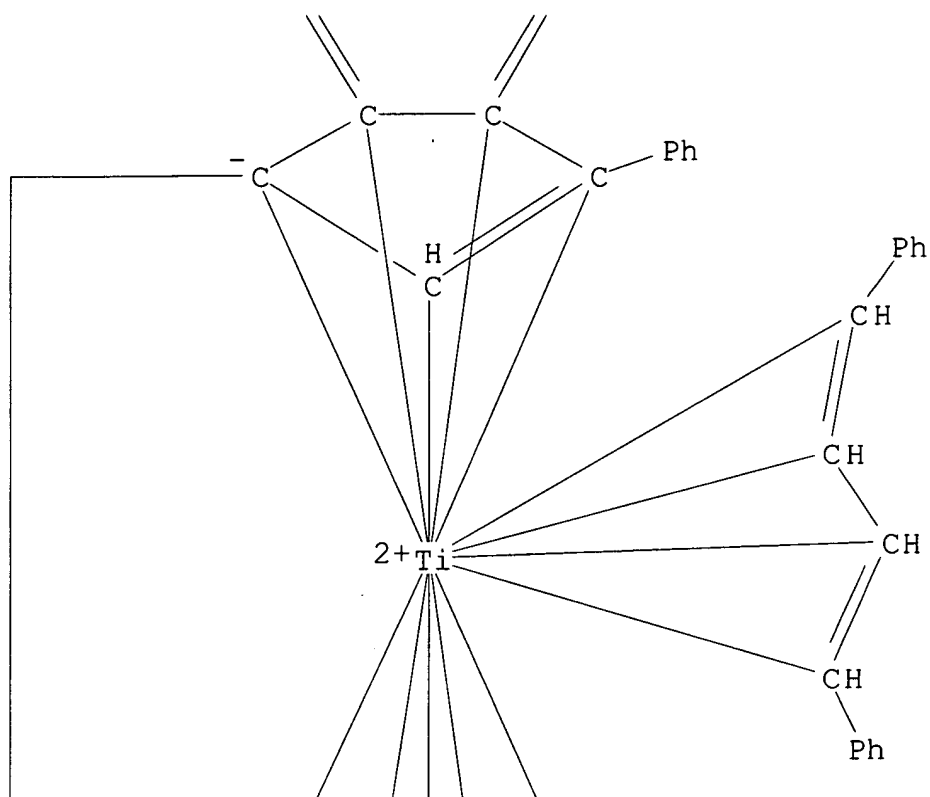


RN 244147-13-5 ZCAPLUS  
CN Titanium, [1,1'-(.eta.4-1,3-butadiene-1,4-diyl)bis[benzene]][1,2-ethanediylbis[(1,2,3,3a,9a-.eta.)-5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-2-phenyl-1H-benz[f]inden-1-ylidene]]- (9CI) (CA INDEX NAME)

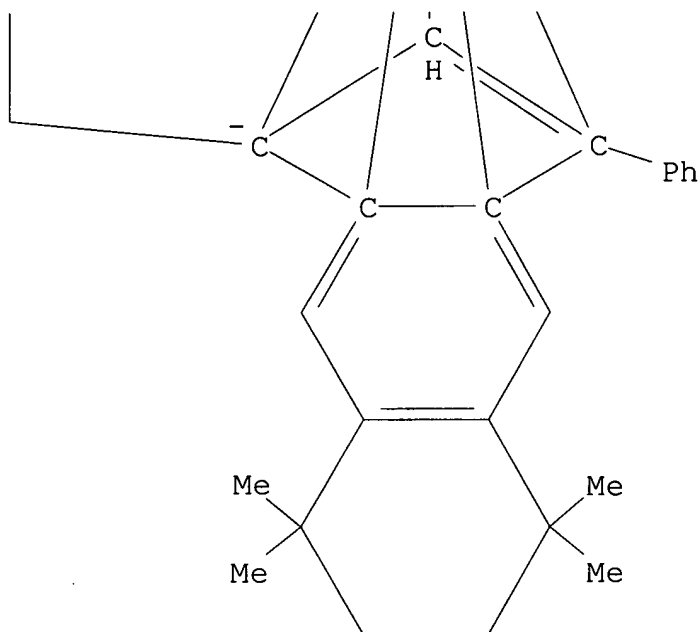
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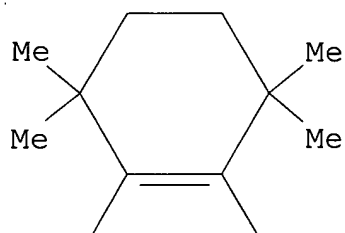
IT **244147-25-9P**

(in integrated metallocene catalyst manuf. for olefin polymn.)

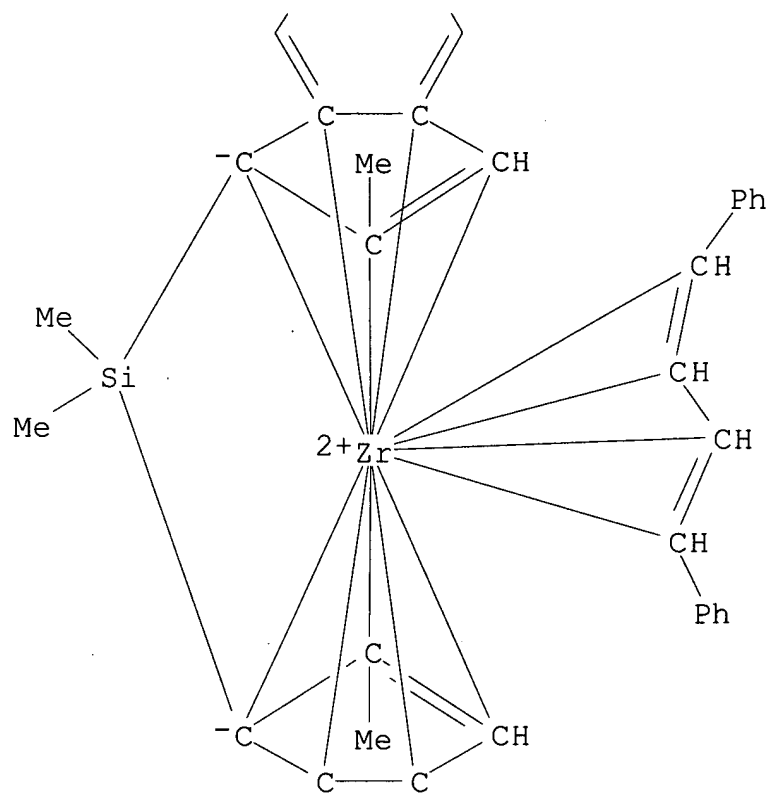
RN 244147-25-9 ZCAPLUS

CN Zirconium, [1,1'-[.eta.4-(1E,3E)-1,3-butadiene-1,4-diyl]bis[benzene]][(dimethylsilylene)bis[(1,2,3,3a,9a-.eta.)-5,6,7,8-tetrahydro-2,5,5,8,8-pentamethyl-1H-benz[f]inden-1-ylidene]]-, stereoisomer (9CI) (CA INDEX NAME)

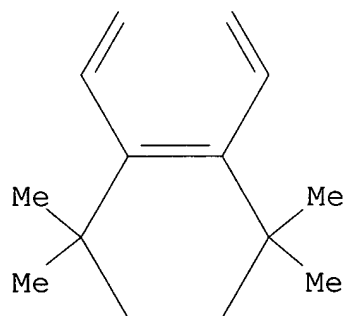
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IT 244146-41-6 244146-42-7 244146-43-8  
244146-44-9 244146-50-7 244146-51-8  
244146-52-9 244146-53-0 244146-64-3  
244146-65-4 244146-66-5 244146-67-6  
244146-77-8 244146-78-9 244146-79-0  
244146-81-4 244146-96-1 244146-97-2

**244146-98-3 244146-99-4 244147-10-2****244147-11-3 244147-12-4 244147-13-5**

(for olefin polymn. and manuf. of polyolefin having high mol. wt.  
and high comonomer incorporation even at high polymn. temp.)

**IT 244147-25-9P**

(in integrated metallocene catalyst manuf. for olefin polymn.)

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L9 ANSWER 7 OF 8 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:671112 ZCAPLUS

DOCUMENT NUMBER: 130:95875

TITLE: Synthesis and polymerization behavior of  
tetrahydro-2-methylbenzindenyltitanium and  
zirconium compoundsAUTHOR(S): Foster, Patrick; Rausch, Marvin D.; Chien, James  
C. W.CORPORATE SOURCE: Department of Chemistry, University of  
Massachusetts, Amherst, MA, 01003, USASOURCE: Journal of Organometallic Chemistry (1998),  
571(2), 171-181

CODEN: JORCAI; ISSN: 0022-328X

PUBLISHER: Elsevier Science S.A.

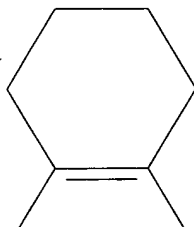
DOCUMENT TYPE: Journal

LANGUAGE: English

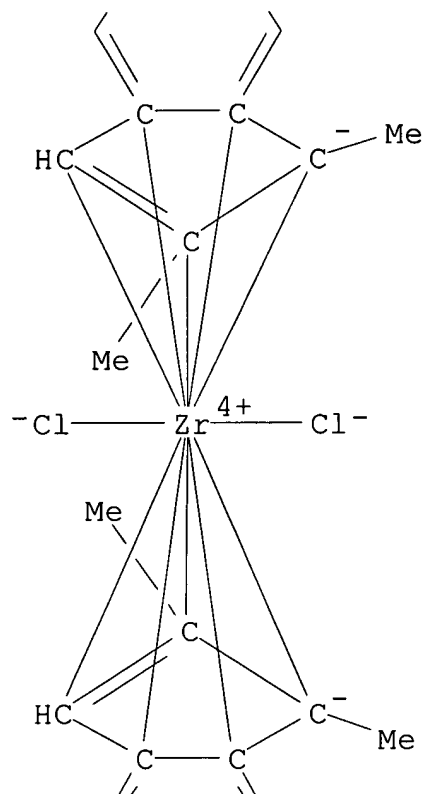
AB In order to further our study of the bis(2-methylbenz[e]indenyl)zirconium dichloride catalyst system, the analogous ligand, tetrahydro-2-methylbenz[e]indene (I), was synthesized. In the process of synthesizing I, the structural isomer tetrahydro-2-methylbenz[f]indene was also formed. This has been confirmed by the synthesis of tetrahydro-2,3-dimethylbenz[f]indene (II), tetrahydro-2,3-dimethylbenz[e]indene (III), and tetrahydro-2-methyl-3-phenylbenz[e]indene (IV) and the titanium trichloride derivs. (.eta.2-tetrahydro-2-methylbenz[e]indenyl)titanium trichloride and (.eta.5-tetrahydro-2-methylbenz[f]indenyl)titanium trichloride. The new ligand systems I, II, III, and IV were converted to the analogous unbridged zirconocene dichloride complexes bis(.eta.5-tetrahydro-2-methylbenz[e]indenyl)zirconium dichloride, bis(.eta.5-tetrahydro-2,3-dimethylbenz[f]indenyl)zirconium dichloride, bis(.eta.5-tetrahydro-2,3-dimethylbenz[e]indenyl)zirconium dichloride, and bis(.eta.5-tetrahydro-2-methyl-3-phenylbenz[e]indenyl)zirconium dichloride. The precursors were then activated with either methylaluminoxane (MAO) or triphenylcarbenium tetrakis(pentafluorophenyl)borate (trityl) and used as catalysts for the polymn. of ethylene and propylene. All zirconocene complexes were highly active for the polymn. of ethylene, and in some cases

produced cryst. polypropylene at lower polymn. temps.  
IT **219485-07-1P**  
(polymn. catalyst, "meso-like"; synthesis and polymn. behavior of  
tetrahydro-2-methylbenzindenyltitanium and zirconium compds.)  
RN 219485-07-1 ZCAPLUS  
CN Zirconium, dichlorobis[(1,2,3,3a,9a-eta.)-5,6,7,8-tetrahydro-1,2-  
dimethyl-1H-benz[f]inden-1-yl]-, stereoisomer (9CI) (CA INDEX NAME)

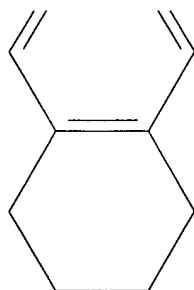
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IT 219485-07-1P

(polymn. catalyst, "meso-like"; synthesis and polymn. behavior of tetrahydro-2-methylbenzindenyltitanium and zirconium compds.)

REFERENCE COUNT:

12

THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 8 OF 8 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:629340 ZCAPLUS

DOCUMENT NUMBER: 130:25156

TITLE: Synthesis and structure of [1,2-bis(1-indenyl)benzene]titanium and zirconium dichlorides

AUTHOR(S): Halterman, Ronald L.; Tretyakov, Alexander; Khan, Masood A.

CORPORATE SOURCE: Department of Chemistry and Biochemistry, University of Oklahoma, Norman, OK, 73019, USA

SOURCE: Journal of Organometallic Chemistry (1998), 568(1-2), 41-51

CODEN: JORCAI; ISSN: 0022-328X

PUBLISHER: Elsevier Science S.A.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The palladium-catalyzed coupling of 1,2-diiodobenzene with indenylzinc complexes obtained from indene, 4-methylindene, 4,7-dimethylindene and hydrindancene gave 1,2-bis(1-indenyl)benzenes in 29-45% yield. New phenyl-bridged ansa-bis(indenyl)titanium and -zirconium dichlorides were obtained from these ligands in good yield either by addn. of  $\text{TiCl}_3$  or  $\text{ZrCl}_4$  to their lithium salts (61-92% yield) or by addn. of  $\text{Zr}(\text{NMe}_2)_4$  to the neutral ligands (59-67%). In each case the zirconium tetraamide metalation gave very high dl-selectivity. The n-BuLi/ $\text{ZrCl}_4$  metalation of the phenyl-bridged unsubstituted indene gave a 3:2 ratio of dl- to meso- while placing substituents at the 4,7- and 5,6-positions led to 10:1 selectivity in favor of the dl-isomer. The n-BuLi/ $\text{TiCl}_3$  metalation gave between 1:1 and 4:1 selectivity. The solid state structure of [1,2-bis(1-indenyl)benzene]dichlorozirconium was obtained by x-ray anal.

IT **215949-40-9P 215949-43-2P 216251-56-8P**

(prepn. of)

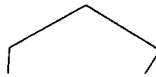
RN 215949-40-9 ZCAPLUS

CN Titanium, dichloro[1,2-phenylenebis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-s-indacen-1(5H)-ylidene]]-, stereoisomer (9CI) (CA INDEX NAME)

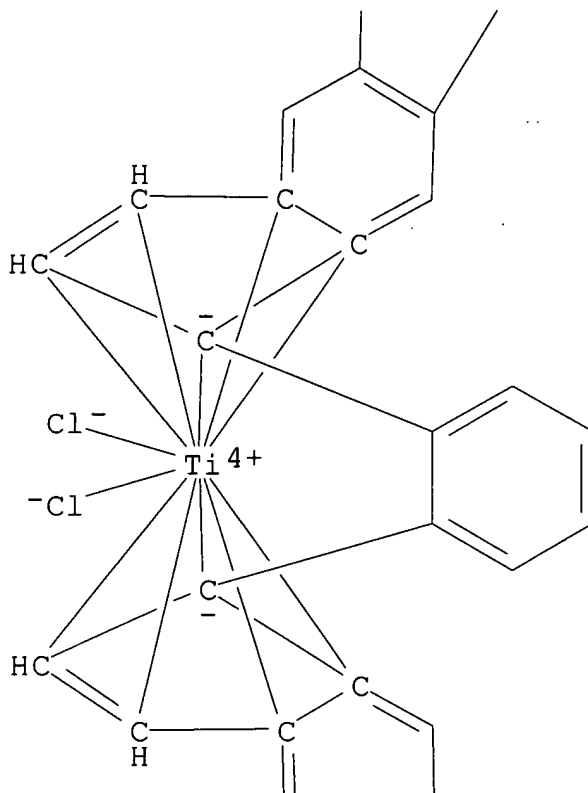
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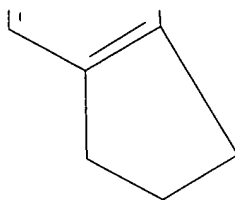
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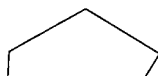


RN 215949-43-2 ZCAPLUS  
CN Zirconium, dichloro[1,2-phenylenebis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-s-indacen-1(5H)-ylidene]]-, stereoisomer (9CI) (CA INDEX NAME)

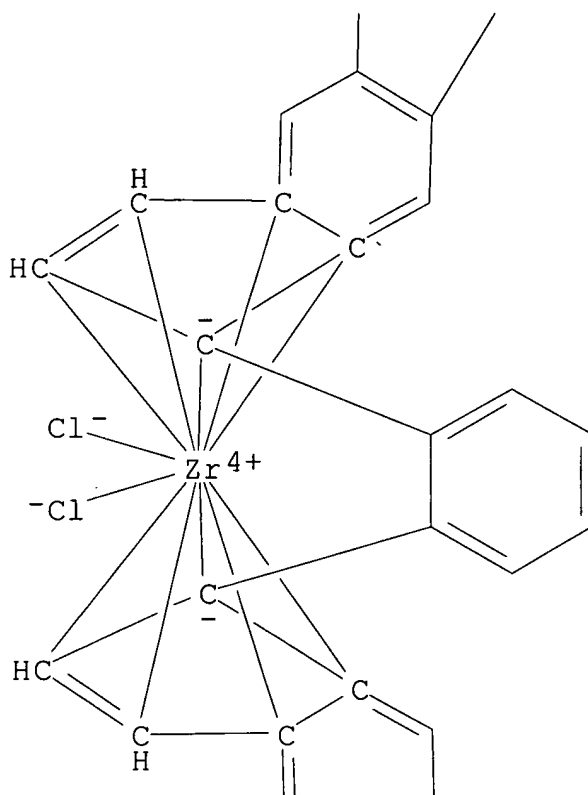
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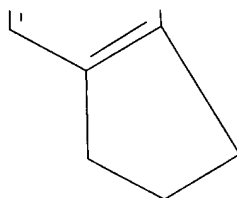
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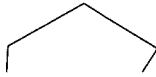


RN 216251-56-8 ZCAPLUS  
 CN Titanium, dichloro[1,2-phenylenebis[(1,2,3,3a,8a-.eta.)-6,7-dihydro-s-indacen-1(5H)-ylidene]]-, stereoisomer (9CI) (CA INDEX NAME)

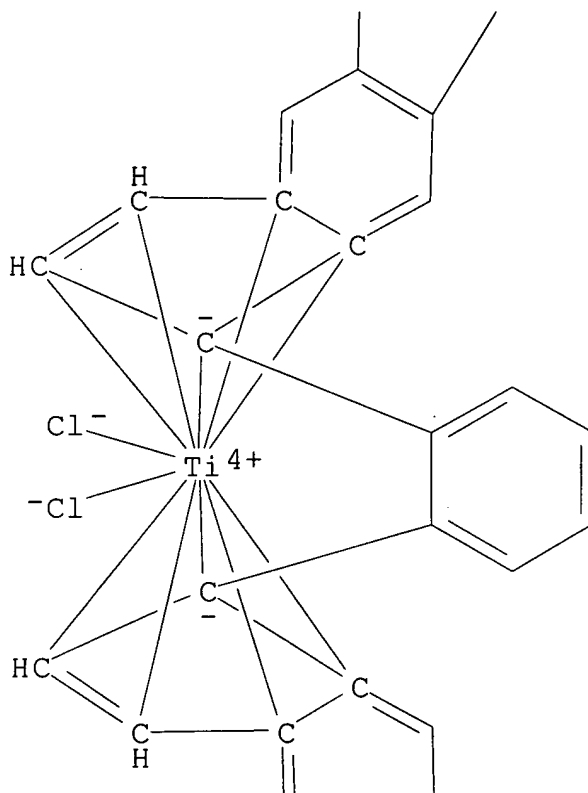
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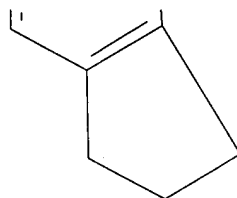
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IT 215949-40-9P 215949-43-2P 216251-56-8P

(prepn. of)

REFERENCE COUNT:

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THERE ARE 48 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT